IRON AGE

THE NATIONAL METALWORKING WEEKLY A Chilton Publication September 8, 1960

★ Industrial Psychologist Dr. Goudet Analyzes

What Causes Executive Success or Failure? p. 69

Appliances Battle for Markets p. 59

Mist Coolant Speeds Sawing Rate p. 95

Digest of the Week p. 2-3

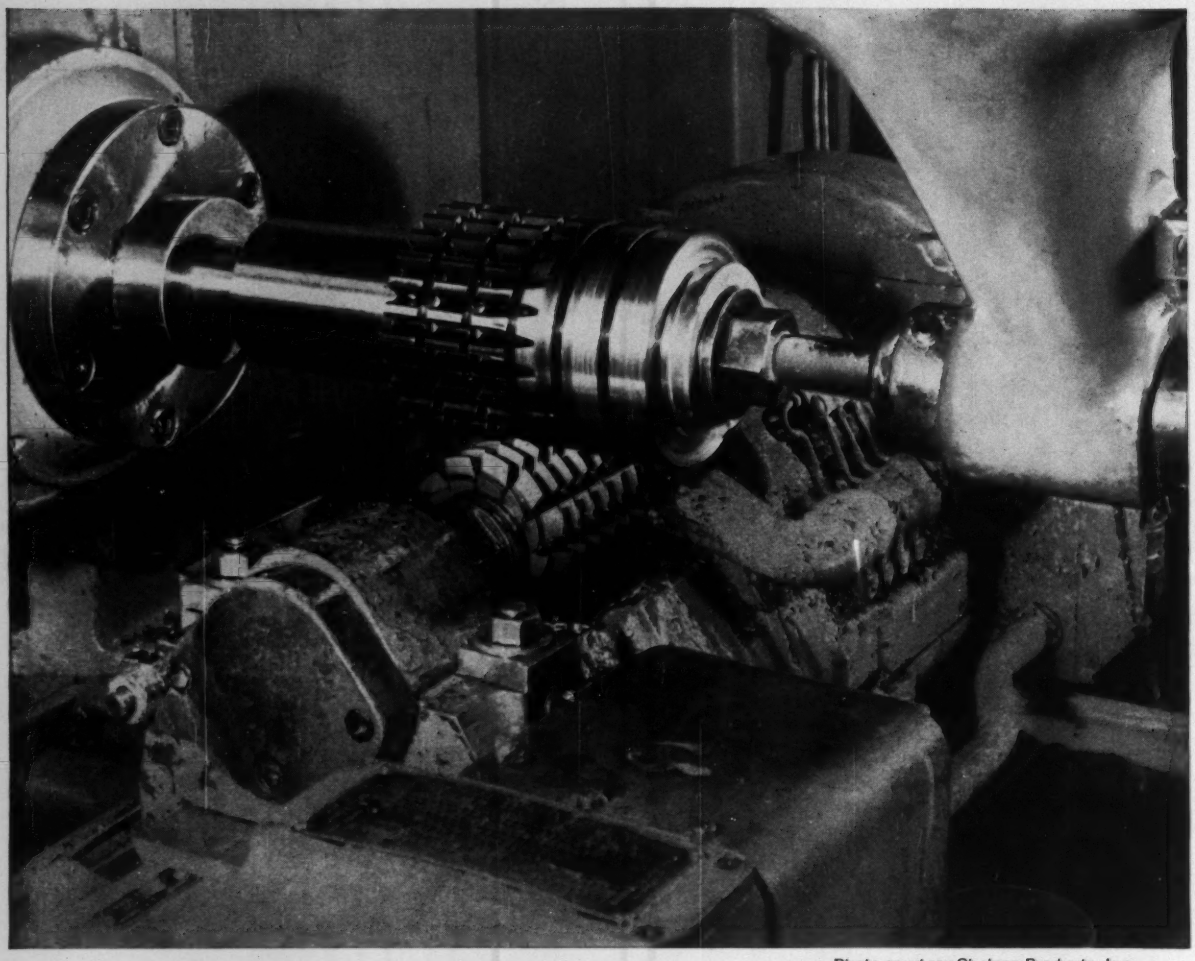


Photo courtesy Chelsea Products, Inc.

Aristoloy Leaded Steel provides free machining for Chelsea Products, Inc.

Steel for gears used in power take-off assemblies must have uniform hard surface, high tensile strength and yet machine freely. Aristoloy Leaded* users have benefited from these qualities.

Chelsea finds more gears can be cut from leaded Aristoloy before the hob needs sharpening. Production can be improved and speeds and feeds increased over non-leaded steel.

Strength and hardness are not affected and the finished part reveals no detectable difference in physical properties from steel previously used.

For complete information call the Copperweld representative in your nearest large city . . . or write today for New Products & Facilities Catalog.

*Inland Ledloy License

ARISTOLOY STEELS

DIVISION OF
COPPERWELD
STEEL COMPANY

ARISTOLOY STEEL DIVISION • 4001 Mahoning Ave., Warren, Ohio • EXPORT: Copperweld Steel International Co., 225 Broadway, New York 7, N. Y.

American-LaFrance pumper at Dewey Fire Co. No. 1, Hellertown, Pa.

Sheet Steel to the Rescue!

Who doesn't thrill to the flashing color and competent power of a modern fire engine roaring by on its errand of mercy?

Hard-working trucks like these need husky steel to safely haul their cargo of men and fire-fighting machinery. Bethlehem supplies hot-rolled and cold-rolled sheets to most of the makers of fire apparatus and fire-protection equipment.

If your product involves sheet metal, steel is the material with which to design and work. You can always count on Bethlehem sheet steel for top quality. Our engineers will be glad to work with you.

Steel

For strength
... economy
... versatility

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.
Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM STEEL

BETHLEHEM STEEL

Mack C95F pumper for City of Lapeer, Mich.

THE IRON AGE
Chestnut and 56th Sts.
Philadelphia 39, Pa., SH 8-2000

GEORGE T. HOOK, Publisher

EDITORIAL STAFF

TOM C. CAMPBELL, Editor-in-Chief
GEORGE F. SULLIVAN, Editor
E. C. BEAUDET, Managing Editor

News Editor R. D. Raddant
Technical Editor J. J. Obrzut
Asst. News Editor H. R. Neal
Machinery Editor R. H. Eshelman
Metallurgical Editor C. L. Kobrin
Welding Editor R. R. Irving
Nonferrous Editor—N. Y. F. J. Starin
Art Director T. S. Peaby

Associate Editors: P. J. Cathey, W. N. Redstreake, J. D. Baxter, R. J. Radomski, M. J. Tatich, B. F. Surer. Assistant Editor: G. C. Sekula. Regional Editors: K. W. Bennett, Chicago; T. M. Rohan, Cleveland; A. E. Fleming, Detroit; R. R. Kay, Los Angeles; G. J. McManus, Pittsburgh; G. H. Baker, R. W. Crosby, Washington. Correspondents: F. L. Allen, Birmingham; N. Levenson, Boston; R. E. Koebbe, St. Louis; J. Miller, San Francisco; R. Kazarian, Buffalo; D. R. Coughlin, Seattle; A. T. Collins, Houston; F. Sanderson, Toronto; F. H. Harley, London, England. Chilton Editorial Board; Paul Wooton, Washington representative.
Robt. Gunning—Readability Consultant

WASHINGTON EDITORIAL OFFICE
Washington 4...National Press Bldg.

BUSINESS STAFF

Marketing Manager R. H. Groves
Circulation Manager W. M. Coffey
Production Manager Warren Owens
Promotion Manager R. A. Wilt
Mkt. Research Manager G. V. Shanno
Census Manager William Laimbeer
Research Consultant Oliver Johnson

REGIONAL BUSINESS MANAGERS
*Denotes editorial office also

Atlanta 3.....J. W. Sangston
32 Peachtree St., N. E. Jackson 3-6791
*Chicago 1...T. H. Barry, W. R. Pankow
360 N. Michigan Ave. Randolph 6-2166
*Cleveland 15, R.W.Watts, R. L. White
930 B. F. Keith Bldg. Superior 1-2860
Columbus 15, Ohio...Harry G. Mumm
LeVeque-Lincoln Tower Capital 1-3764
Dallas 6.....W. J. Smyth
189 Meadows Bldg. EMerson 8-4751
*Detroit 2.....W. J. Mulder
103 Pallister Ave. Trinity 1-3120
*Los Angeles.....R. Raymond Kay
1920 Strand
Manhattan Beach Faculty 1-5306
*New York 17...C. T. Post, I. E. Hand
100 E. 42nd St. Oxford 7-3400
*Philadelphia 39—
B. L. Herman, J. A. Crites, W. E. Carr
Chestnut & 56th Sts. Sherwood 8-2000
*Pittsburgh 19.....T. M. Fallon
1707 Frick Annex Bldg. Atlantic 1-1830
San Francisco 3.....Don May
1355 Market St. UNderhill 1-9737
W. Hartford 7.....Paul Bachman
62 LaSalle Rd. Adams 2-0486
England.....Harry Becker
15 Gratton St., Altrincham, Cheshire
J. H. Kofron....Chilton Research Dir.

A Chilton Publication

CHILTON OFFICERS & DIRECTORS

G. C. Buzby, President

Vice-presidents: P. M. Fahrendorf, L. V. Rowland, G. T. Hook, R. E. McKenna; Treasurer: W. H. Vallar; Directors: M. E. Cox, F. P. Tighe, E. B. Terhune, Jr., R. W. Case, Jr., C. A. S. Heinle, J. H. Kofron, G. E. Cameron. Comptroller, Stanley Appleby. Indexed in Applied Science & Technology Index and Engineering Index.

Copyright 1960 by Chilton Company

THE IRON AGE, published every Thursday by CHILTON COMPANY, Chestnut & 56th Sts., Philadelphia 39, Pa. Second class postage paid at Philadelphia, Pa. Price to the metalworking industries only or to people actively engaged therein, $2 for 1 year, $3 for 2 years in the United States, its territories and Canada. All others $15 for 1 year; other Western Hemisphere countries, $25; other Foreign Countries, $35 per year. Single Copies 50¢. Annual Review Issue $2.00. Cable: "Chilton," Philadelphia

The IRON AGE

September 8, 1960—Vol. 186, No. 10

Digest of the Week in

★Starred items are digested at right.

EDITORIAL

Latin American Turmoil: We'll Have To Use Patience 5

METALWORKING NEWSFRONT

Business Forecast 7
Metalworking Labor 9
Washington 11
International 13
Techfront 15
Market Planning Digest 57
Report to Management 67

NEWS OF THE INDUSTRY

★Appliance Makers Buck Market 59
★GE Tries New Approach With IUE 61
★Cuba: A Danger Signal for U. S. 62
★Industry Tears the Lid Off Cans 64
★Executive Success, Part I 65
★Automotive 73
★West Coast 75
Machine Tools 77
The IRON AGE Salutes 81

ENGINEERING-PRODUCTIION

★Sawing Nonferrous Metals 95
★Shape Stainless Honeycombs 98
★Computer Service Aids Industry 100
★Magnetic Stirring Process 102
Spherical Powders Find New Uses 105
★Hearth Control Boosts Output 106
Self-Locking Aluminum Panels 108
Design for Gamma-Ray Safety 110

MARKET AND PRICE TRENDS

★The IRON AGE Steel Summary 137
★Purchasing 138
Iron and Steel Scrap Markets 142
Nonferrous Markets 144

REGULAR DEPARTMENTS

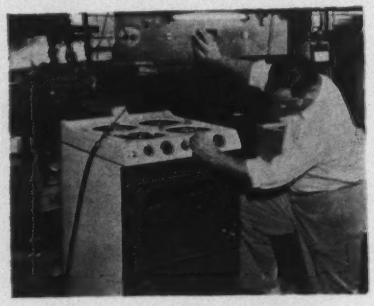
Letters From Readers 19
Fatigue Cracks 21
Industrial Briefs 78
Men in Metalworking 83
You Arbitrate It 92
Free Literature 115
Design Digest 118
New Equipment 128
Clearing House 154

INDEX TO ADVERTISERS 158

News of the Industry

APPLIANCE MARKET

An Uphill Struggle — Sales of major appliances usually follow housing construction trends. But ap-



pliance sales have fallen less than half as much as the decline in new homes. Some new marketing efforts are beginning to pay off. P. 59

GE'S NEW LABOR PLAN

Job Security — General Electric tries a new approach to job security in contract offer to IUE. Two points: A plan to provide laid-off workers with immediate benefits; a plan to train displaced workers while paying them 95 pct of regular pay. P. 61

LATIN AMERICA

Situation Doubtful — Events in Cuba are symptoms of unrest throughout Latin America. Swing to left is likely in a number of governments. Meanwhile, risk capital is withdrawing from South America as result of Cuba's anti-U. S. policies. P. 62

Metalworking

Cover Feature

EXECUTIVE ANALYSIS — This is Dr. Frederick J. Gaudet, Director of the Laboratory of Psychological Studies, Stevens Institute. In the first of a series of three articles he indicates why executives fail. P. 69

BATTLE FOR CANS

Shaping Up Fast — Auminum producers and machinery makers have teamed up to crack the can market wide open. And the result is proving attractive to packers and processors. But steelmakers still hope to hold on to this traditional market with the introduction of a new thin tinplate. P. 64

Engineering-Production Developments

ACCURATE CIRCULAR SAW

Cuts Nonferrous Metals—In the cutting of nonferrous metals, two production factors are paramount: Cutting speed and surface finish. A high-speed circular saw cuts thin-walled extrusions or solid sections up to 8 in. thick with equal ease. It cuts through 8-in. diam aluminum ingots in one minute—with a surface finish between 30-40 micro-inches. P. 95

CERAMIC PLATENS

Shape Stainless Honeycombs — An economical process forms high-strength stainless steel honeycomb panels up to 7 x 28 ft. The entire brazing, conditioning and aging cycle is handled in a single, low-cost tool. Ceramic platens play a key role in forming these stainless honeycomb panels. P. 98

COMPUTER SERVICE

Aids Industry — Computer-assisted programming reduces production costs. However, it often proves too expensive for small companies. There's a way around this bottleneck. A manufacturer offers tape-control service. P. 100

MAGNETIC STIRRING

Refines Metal Structure — Arc-melted metals are hard to fabricate in the as-cast state. Why? Because they have a coarse grain structure. Magnetic stirring, during melting, reduces grain size and improves soundness. P. 102

HEARTH CONTROL

Affects Furnace Output—A newly rammed hearth should slope toward the center of an electric furnace. It should present a wide melting area. This speeds the melting of heavy scrap charges. P. 106

Market and Price Trends

AUTOMOTIVE

Bigger Aims—Chevrolet expects to pass its record for total sales with the introduction of its 1961 models. Corvair will play a big part in this with the addition of two station wagons and two pickup trucks to its line. P. 73

WEST COAST

Optimistic? — Farwestern steel executives feel 1960 will end on a good note. They predict an upswing in sales for the final quarter. Allied industries are also optimistic about a good second half. P. 75

STEEL SUMMARY

Some Improvement — The best that can be said about the steel market is that the rate of orders is inching up without new automotive support. Improvement is slight, but it is relatively general. Automotive orders continue to come in, but slower than normal. P. 137

PURCHASING

Stable Market—Adhesive makers say the market should remain steady for the rest of the year. Increased auto production and construction could mean a good last quarter. P. 138

NEXT WEEK

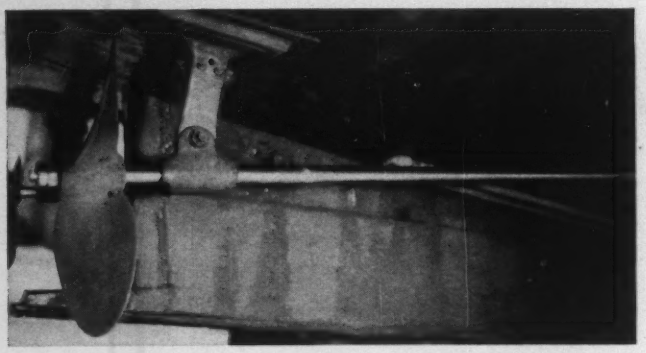
LOOK AHEAD

The Emphasis — In an exclusive IRON AGE interview, E. J. Hanley, president, Allegheny Ludlum Steel Corp., takes a look into the steel industry's future. He says emphasis must be placed on improving operations and reducing costs.

Armco 17-4 PH Stainless

Solves Another Shafting Problem

Boat shafts of Armco 17-4 PH resist bending, wear, seawater



New strut and propeller on the **Mary Reed**, with the same rugged 17-4 PH stainless shaft. It's hard to believe that this shaft, with a heavy propeller on the end, could operate without the supporting strut. **But it did!**

A 5-foot section of the propeller end of one shaft was left unsupported after the 39-foot charter fishing boat *Mary Reed* struck a submerged object. Normally, a boat so damaged would have required a tow, or be forced to return slowly to port on one engine. Not the *Mary Reed*. She was able to operate all day at cruising speeds in rough water. The reason: The unsupported shaft was made of Armco 17-4 PH Stainless Steel.

The **Mary Reed's** two 9-foot 9-inch shafts, 1¼ inches in diameter, are made of Armco 17-4 PH Stainless Steel. Both have been in service since the spring of 1958.

MORE ASHORE

Landlubbers are finding a growing number of uses for 17-4 PH, too. Longer lasting *shafts, valves, fasteners, hydraulic fittings,* and other products are produced from this special stainless. These 17-4 PH advantages show some of the reasons:

1. Superior resistance to bending and deflection. 2. High strength. 3. Excellent wear resistance and toughness. 4. Corrosion resistance in the class of 18-8 in many environments.

We'll be happy to send you more information. Just fill in and mail the coupon.

New steels are born at Armco

ARMCO STEEL CORPORATION
2300 Curtis Street, Middletown, Ohio

☐ PLEASE SEND catalog on Armco 17-4 PH Stainless Steel.

☐ Please have Armco Salesman call.

Name_____ Title_____

Firm_____

Street_____

City_____ Zone_____ State_____

ARMCO STEEL

Armco Division • Sheffield Division • The National Supply Company • Armco Drainage & Metal Products, Inc. • The Armco International Corporation • Union Wire Rope Corporation

Latin American Turmoil: We'll Have to Use Patience

Whatever we may think, the problem in Latin America is ours as much as it is theirs. It did not come over night. And it is not going to be settled on a crash or crisis basis.

It may be that we do not know clearly just what is happening in South and Central America. People there are on the march. The gap between the very rich and the very poor is going to be narrowed come hell or high water!

For years we have been tossing money to the four winds in an effort to make friends, shore up shaky governments and properly assist our Allies. Much of it has gone for good purposes and the results have been as positive as we could expect.

But it would be sheer poppycock to say that a big slice of the money did not go down the drain. You can't buy everything with money.

Mighty little money found its way to South and Central America—or to Mexico. What money went to those nations was invested by courageous and farseeing business people. The collapse of confidence and trust in Cuba is one of the facts of life for foreign investors.

The trend is toward a peoples' revolution in many Latin lands. Private investment has grown cautious to the point where new money will be hard to come by for new projects there. But that does not absolve our government from its responsibilities. In fact, it intensifies them.

There is too much at stake to become mired in the mud of inaction. Since we only recently realized what our problem is in Latin America, cries of crisis and haste are heard.

All that may be true. But the Latins do not act and think as we do. Nor can we expect them to "hop to it" just because—after a Rip Van Winkle doze—we now see the light.

Latin peoples have their varied heritages. The slowness of their people of wealth to see the plight of the poor is part of the trouble. They need our help. What the help will be will have to be worked out with patience, cooperation, and lack of the Big Stick posture.

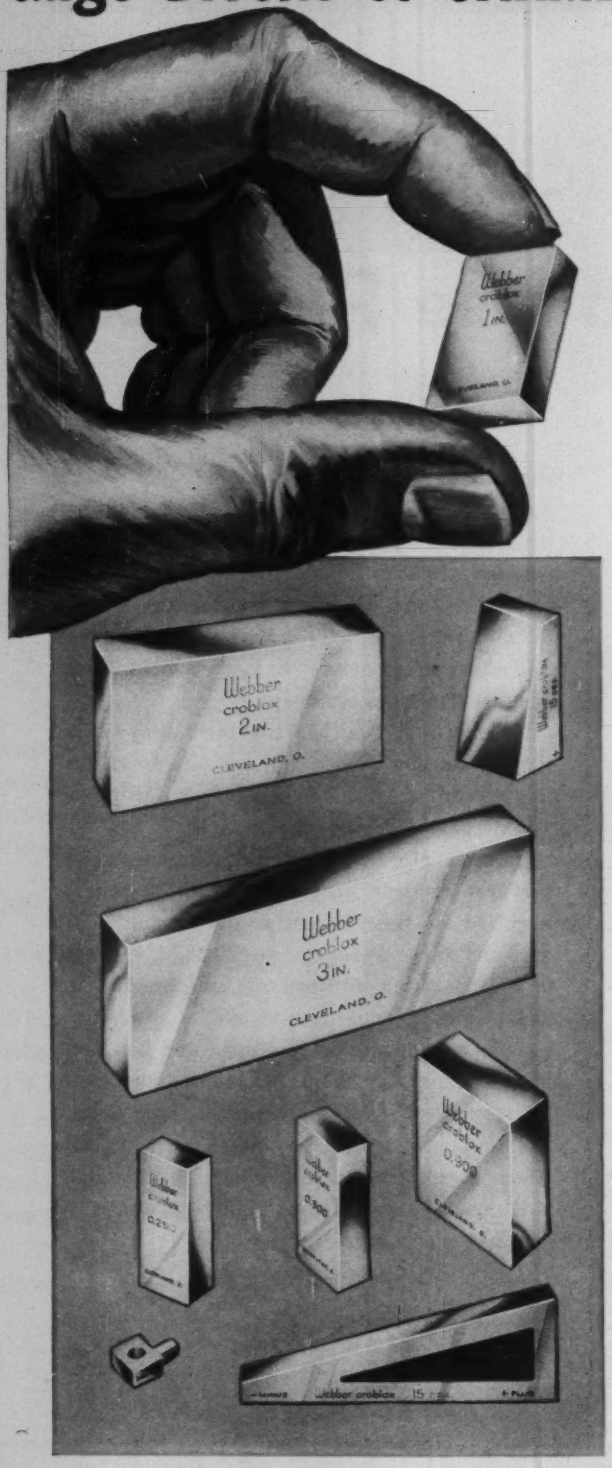
What we did **not** do to Russia and her Satellites, we can not do to our neighbors to the South. We have every right to be adamant about Castro. But we are wrong if we think the rest of Latin America will jump at our bidding even though it is couched in courteous diplomatic terms. It just isn't in the cards.

That's why we need patience!

Tom Campbell

Editor-in-Chief

Gage Blocks of CARMET Chromium Carbide



for new standards of dimensional control!

For enduring, ultra micro-accurate surface finishes and dimensional stability, CARMET Chromium Carbide represents the ultimate gage block material.

Harder by nature than steel . . . next to a diamond in hardness, yet far tougher . . . Chromium Carbide Gage Blocks withstand rougher use, eliminate costly dimensional errors, and cut frequency of calibration and replacement. They have a thermal coefficient of expansion similar to steel. Fingerprints are not harmful.

Lightweight, non-oxidizing, possessing superior "wringability" and a stable, fine grain structure that takes and holds a mirror-smooth gaging surface . . . CARMET Chromium Carbide in gage blocks is leading the way to rigid new standards of dimensional control.

Carmet doesn't make gage blocks, but furnishes the chrome carbide to the progressive manufacturers who do.

A precise blend of extremely hard, finely divided carbides of chromium with a nickel binder, CARMET Chromium Carbide assures predictable, consistent behavior and unmatched uniformity from piece to piece.

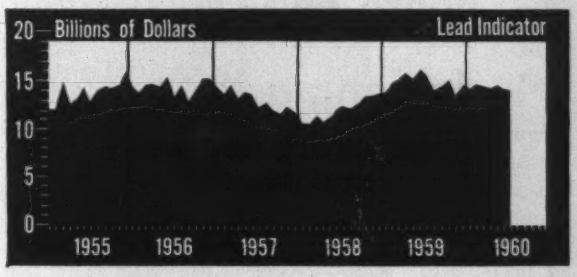
These same unique characteristics make CARMET Chromium Carbide an important material for extrusion dies, valve seats, sealing rings, chemical processing equipment . . . or any other application where resistance to oxidation, corrosion, abrasion, erosion or chemical attack may be involved. For more information, contact your local Allegheny Ludlum CARMET representative, or write: ***Allegheny Ludlum Steel Corporation, Carmet Division, Ferndale, Detroit 20, Michigan.***

1726

CARMET® AL

CEMENTED CARBIDE · DIVISION OF ALLEGHENY LUDLUM

New Orders Continue Decline



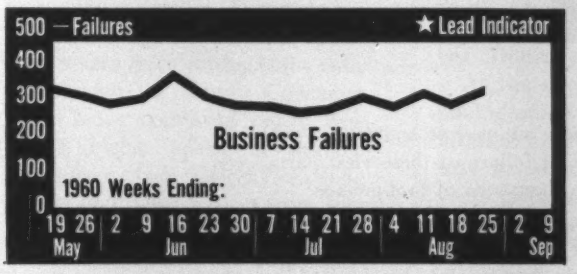
For the seventh straight month, new orders for durable goods in July seasonally adjusted, ran behind sales. New orders totaled $14.1 billion against $14.8 in sales. This means that backlogs are declining and the trend must reverse before the correction period ends.

In all manufacturing, new orders in July declined from $30.1 billion in June to 29.4 billion. Sales for all manufacturing totaled $30.6 billion in July.

Failures at Eleven-Week High

Business failures are running ahead of last year and the late summer rate of casualties reflects the "correction" period. Failures for the week ending Aug. 25 totaled 315, the highest in 11 weeks, and well over the weekly average of 296 for the year.

Failures for the preceding week totaled 279, and



casualties for the comparable week in 1959 totaled 257. To date comparisons: 10,079 failures so far in 1960 compared with 9,604 in 1959.

Auto Capital Spending Plans

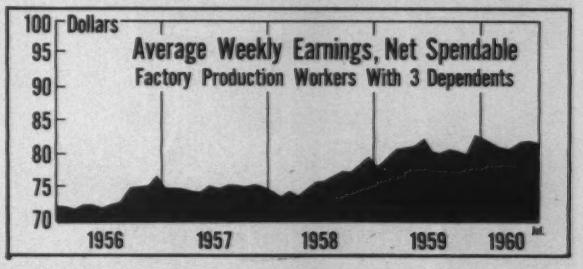
Running counter to capital spending trends in most industries are some automotive building plans. Chevrolet will have new construction projects in the works at 19 plants before the end of next year. They will add more than 2.5 million sq ft of manufacturing space. Also planned 1.7 million sq ft more floor space at 11 Chevrolet warehouse locations. American Motors will spend $11 million more, added to its current program.

Consumers Show Caution

Instalment credit rose in July by the smallest monthly gain since November, 1958. The gain of $249 million brought the total installment credit to $41.687 million. The small rise reflected apparent consumer caution.

Earnings Join Declining Group

Summer declines among the business indicators include spendable earnings. Dept. of Labor statistics indicate that average weekly spendable earnings for



a worker with three dependents totaled $81.23 in July. This is a slight decline from $81.59 in June. Gross everage weekly earnings in July totaled $91.14, down from $91.60 in June.

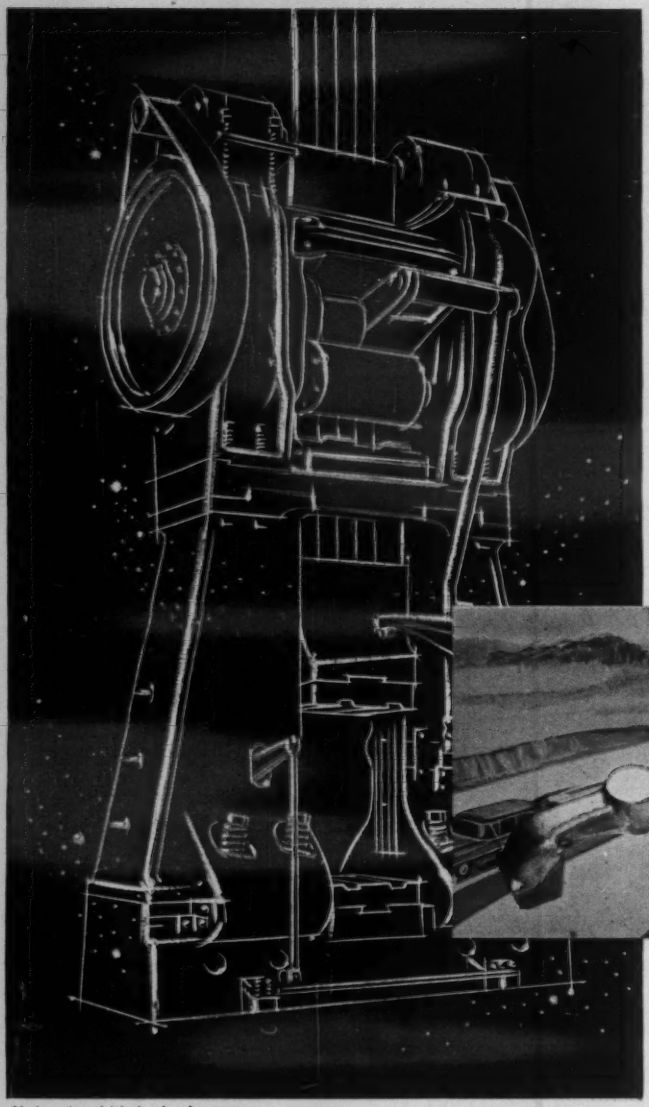
Will 1961 Cars Use Less Steel?

Those who blame some of the decline in steel this year on the surge of new compact cars will really have something to talk about with the new 1961 lines. Some of the standard makes will have from 100 to 500 lb less of steel per car in the 1961 lines. Actually, few steel people blame the compacts for steel declines. Automakers have been holding up, rather than bringing down, steel operations through much of this year.

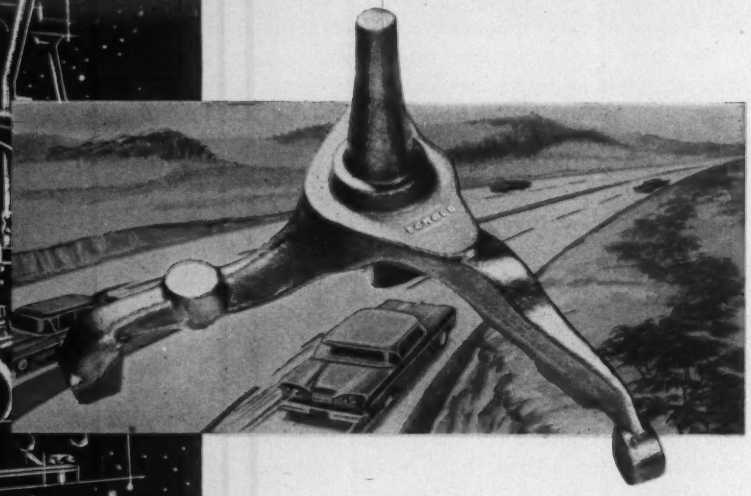
What Happened to Automotive?

In past years, the pattern of buying by the auto industry has been for big orders of steel and other materials timed with the start of production of new models. This year, the "bunching" of buying has not materialized outwardly. Reason: The rate of buying was maintained at a high level through July and August and automakers are going into 1961 production with sizeable inventories.

SHOCK-STRENGTH of steering spindle soars by designing it to be forged



Modern board-lift forging hammer



By designing front-end spindles to be forged, automobile and truck manufacturers practically eliminate danger of failure of these vital parts, even under sudden turning stress that can reach thousands of foot-pounds.

Start your designs by planning to use forgings everywhere there's a high degree of stress, vibration, shock, or wear. Forged parts withstand them all better than parts made by other fabrication methods. And forgings have no hidden voids to be uncovered after costly machining hours have been invested . . . the hammer blows or high pressures of the forging process compact the *better* forging metal, make it *even better.*

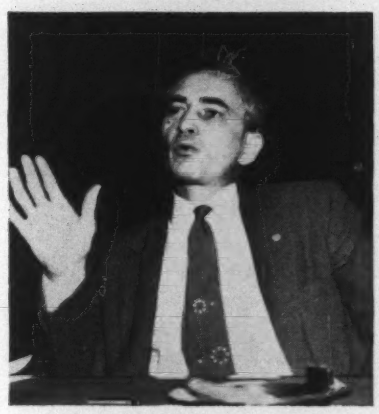
Write for literature on the design, specification, and procurement of forgings.

When it's a vital part, design it to be FORGED

Drop Forging Association • Cleveland 13, Ohio

Names of sponsoring companies on request to this magazine.

IUE: GE Attacks Cost-of-Living Clause



CAREY: Steps Backward?

International Union of Electrical Workers' James B. Carey accuses General Electric Co. of taking "several backward steps when it proposed elimination of the cost-of-living provisions." (For details, see p. 61).

However, unseen element in the electrical industry's labor negotiations is the cost squeeze in the durable goods industries. This has been particularly tight in electrical equipment where price cutting is the rule.

Although the overall Consumer Price Index continued on to new record highs, prices of durable goods were down 0.4 pct from June to July and down 1.8 pct from July 1959. This is one reason why the electrical companies are determined to keep the cost-of-living clause out of new contracts—if possible.

Based on the 0.1 pct c-o-l rise in July, electrical companies granted wage increases to 105,000 workers.

USW: On the Decline In Alabama

Number of steelworkers employed in Alabama has dropped about 16,000 in past two years, according to R. E. Farr, director of Dist. 36, USW. He has just completed a survey for the national union in an effort to get a clear picture of the steel mill labor situation.

The report says there are 25,963 USW members on different payrolls in the state. In 1958 there were 42,000. Of those now employed, about 20,000 are working a 40-hour week, 5000 work less. Six months ago 29,000 were employed.

Douglas Pays Back

Salaried workers at Douglas Aircraft Co. will receive restoration of all pay cuts retroactive to the time they took effect last April.

Action was taken immediately after receipt of an arbitrator's decision the company must restore salary cuts to members of Southern California Professional Engineering Assn. The engineers filed grievances under their contract.

Compacts Add to Jobs

Chevrolet will add five new models for 1961 to the three already in its compact Corvair line.

More than 2600 additional jobs will be created at Chevrolet's manufacturing and assembly plants for production of five new models to be added to the 1961 Corvair line.

"It's conservative to estimate that an equal number of jobs will be created at supplier divisions of General Motors and scores of independent parts suppliers," predicts E. N. Cole, general manager.

TWU: How Long a Strike?

Michael J. Quill, president of the Transport Workers Union, brought about the first shutdown of the Pennsylvania Railroad in its 114 year history at midnight last Thursday.

At the same time, the tough-talking union leader gave an indication of how tough the strike may be to settle: "It took 114 years to close down the railroad and it may take 114 months to open it."

At issue: TWU demands for a complicated set of job classifications limiting assignment of men from one job to another; and a demand the railroad stop farming out repair and construction work on equipment that could be performed by Pennsy workers.

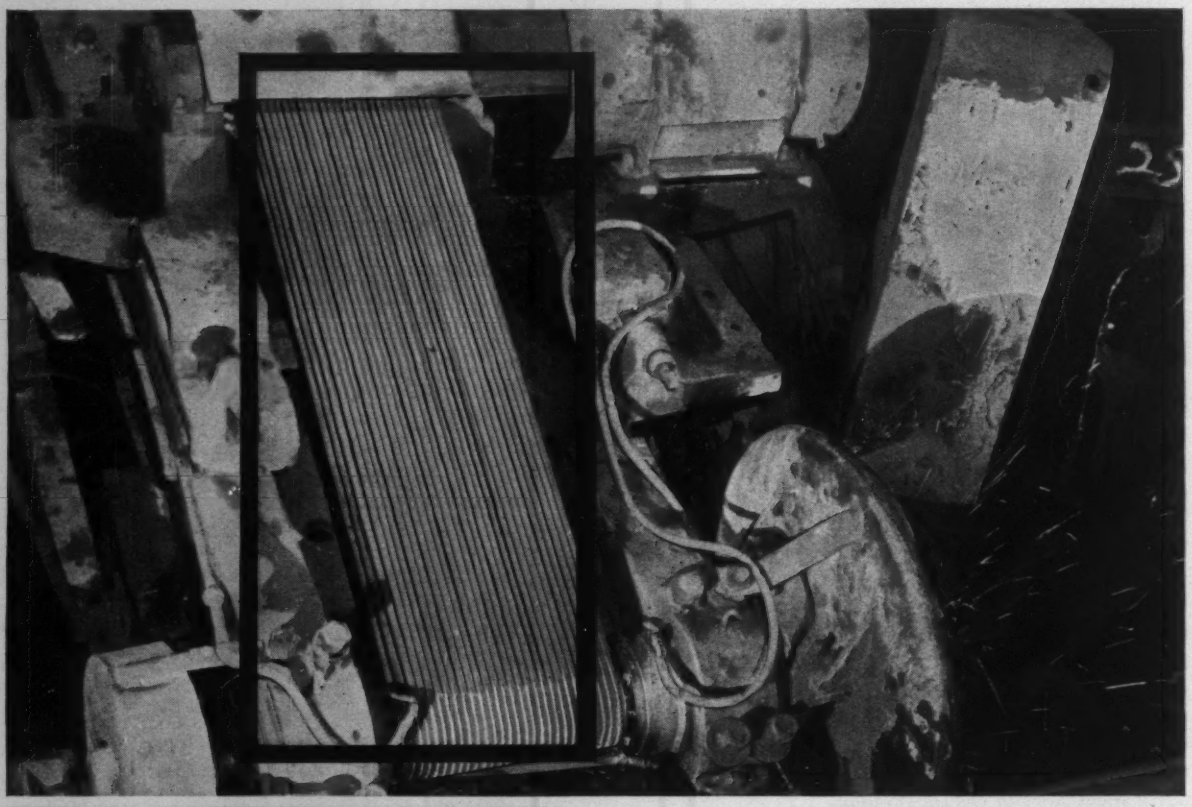
Users of the nation's largest railroad were taking no chances. A check of East Coast and Midwest metalworkers showed most are able to use alternate routes or alternate means of transportation. Only a few announced they would have to cutback operations or close down. But a prolonged shutdown will cause a significant industrial slowdown.

At worst, the railroad walkouts cause localized interruptions in industry. In most cases, alternate routes are available.

But the disturbances go deeper than individual cases. They are symptomatic of the mess smothering U. S. rail transportation systems. And blame for the mess must be shared by the railroads, unions and government. Not even tearing up the tracks and starting all over again would solve the issues.

Chewing through a steady diet of red-hot, 8-inch steel bars proved too much for the biggest saw at this Western mill. It looked like the V-belt drive would have to be upped by at least 100 h.p. —with costly new sheaves installed to handle the extra load. But the G.T.M.—Goodyear Technical Man—made a suggestion: COMPASS-V-Steel Belts. Today, a matched set of only 28 of his high-capacity belts handle a job that normally calls for 42 belts. Yet there's been no sacrifice in belt-life—no costly sheave replacement. Result: the mill owners saved $500 when they re-powered the saw—will continue to save every time belts are changed.

Compass—T. M. The Goodyear Tire & Rubber Company, Akron, Ohio



GOODYEAR INDUSTRIAL PRODUCTS GTM-Specified
COMPASS-V-Steel Belts for Hot Saw Drive
A Load-carrying section of endless high-tensile steel cable
B Notches open between pulleys, dissipating heat
C Notches compress rounding pulleys, giving continuous gripping surface
D Highest-quality rubber underbody
E Sturdy bias-laid fabric cover resists wear

Grueling service requirements like this are just routine to the G.T.M. Invariably, he has tips — and industrial rubber products — for improving production.

You can always reach him quickly and easily, too. Just contact your Goodyear Distributor—also the man to see for V-Belts, Hose, Flat Belts and other industrial items. He's under "Rubber Goods" or "Rubber Products" in the Yellow Pages. Or write Goodyear, Industrial Products Division, Lincoln 2, Nebraska, or Akron 16, Ohio.

THE BIG NAME IN V-BELTS IS

GOODYEAR

THE GREATEST NAME IN RUBBER

Who Gained in Rump Session?

★ The Democrats failed completely in the rump session of Congress. Not one point of the party's liberal program was passed in the broad form promised by Sen. John F. Kennedy.

Whether this will benefit the Republicans in the coming election remains to be seen. The GOP looks like the Congressional winner now. But who knows how the people will react to Kennedy's campaign speeches—how he tried to help the elderly, school children and underpaid workers — in the next two months.

Failure of Sen. Kennedy's bills for medical care for the aged tied to Social Security, broad minimum wage, Federal aid to schools and housing, and common site picketing, may do him more good than harm. The four-week, tail-end session showed the Democrats could not control their 2 to 1 congressional majority. But how does it show the opposition party?

The Democrats will not only blame the Republicans for stopping Kennedy's liberal aid bills, but for killing most of the aid bills altogether.

Neither party came out of the rump session as well as it went in. The real test of strength will be the campaign trail and not the Senate floor.

Both parties agree on one thing. Kennedy is a more potent campaigner than legislator.

He will not only be blaming the Republicans for killing his bills, but he will be promising the same bills for next year. And there is no doubt, whether it is Kennedy or Nixon in November, the same battles over the bills will be fought in 1961.

■ Army Keeps Missiles

Don't count the Army out of the missile and rocket program despite emphasis on Navy and Air Force rocketry. So says Gen. J. H. Hinrichs, Chief of the Army's Ordnance Corps.

And Gen. Hinrichs goes further. He says the Army will also share in the U. S. space program despite the fact that all Army space funds have been transferred to the National Aeronautics and Space Administration. The Army expects to get some NASA funds by 1962.

Some interesting sidelights from the general: Industry will get 90 pct of the $1.3 billion Ordnance has for missiles and rockets. And, the Army will continue to need conventional weapons in the future, much more than nuclear weapons.

■ National Goals

Non-defense spending by the government, including welfare programs, is growing as fast as defense spending. Economists are asking the question: "How far can we go?"

They should get their answer in December when President Eisenhower's Commission on National Goals will report to him on, among other things, economic growth potential, technological change, and the government's role in shaping the economy.

The report could end up being a factor in setting our national policy.

■ Democrats Keep Defense Spending Issue

Democrats were criticizing President Eisenhower's defense policy right up to the last minute of Congress. It was fair warning that defense and defense spending would be an issue in the election.

Presidential hopeful John F. Kennedy renewed his pledge to increase defense spending if he was in the driver's seat come January.

Defense-minded Sen. Symington, D., Mo., attacked the administration anew. Sen. Symington declared that "our defense strength is deficient in quantity, in quality, in mobility and in organization." He wants Pentagon expenditure ceilings to be junked on high priority defense projects.

■ Mining States Ask More Subsidies

Mining state congressmen are already preparing to fight for more Federal aid to the depressed domestic mining industry in the next session of Congress.

Passage, after 12 years of wrangling, of the lead-zinc subsidy bill has given them new hope.

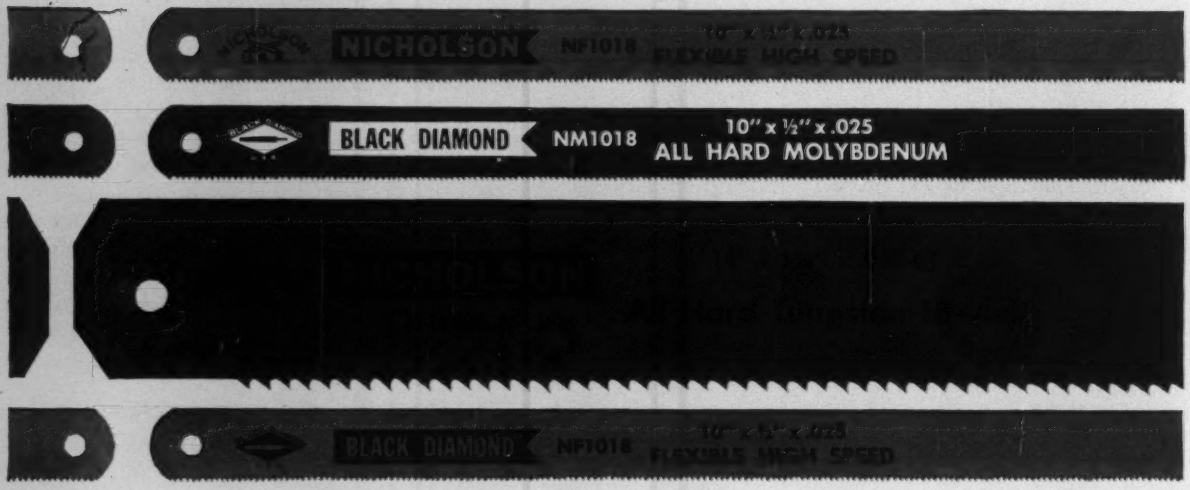
■ Reform Coming For Regulatory Agencies?

Reform in the federal regulatory agencies gets closer and closer to reality. Now President Eisenhower has given it his stamp of approval.

Ike will soon call a "conference on administrative procedure" to study reform. The move has the backing of regulatory agency heads, who told the President of "growing public concern over cumbersome procedures, unnecessary expense, and the delays which have been steadily increasing in some of the procedures of the administrative agencies."

The agencies involved include the Federal Trade Commission, Securities and Excange Commission, Federal Communications Commission, Interstate Commerce Commission, Civil Aeronautics Board, and the Federal Power Commission.

LOOK FOR THESE TRADEMARKS



BUY WITH CONFIDENCE

If you're looking for as fine a blade as money can buy . . . specify Nicholson or Black Diamond. They're among the best respected brands in the metal-working industry.

Here's part of the reason why . . . we make our blades from the finest available steel, according to the latest manufacturing methods. We inspect them again and again. We approve only those blades that meet our high standards.

More important, you can be confident that you're getting quality blades to produce quality work.

A good many industrial blade users and buyers are switching to the Nicholson and Black Diamond brands. The best gauge of the way they like them is the way they keep reordering them. The next time *you* order blades . . . order Nicholson or Black Diamond blades. You'll be specifying the economy of top quality.

✻ ***Industrial Distributors provide the finest goods and services in the least possible time. Our products are sold exclusively through them.***

NICHOLSON NICHOLSON FILE COMPANY, PROVIDENCE 1, RHODE ISLAND

FILES • ROTARY BURS • HACKSAW AND BAND SAW BLADES • GROUND FLAT STOCK • INDUSTRIAL HAMMERS

Exports Up Over 1959

In an unusual turn, July exports of U. S. goods held steady and totaled $1.722 billion. Of this, $70 million was in military aid shipments, according to the Dept. of Commerce.

For the three month period ended with July, exports were a little more than $20 billion. This is about $1 billion higher than in the three preceeding months.

The revised figure for June is set at $1.738 billion, of which $100 million was in military aid.

Estimates of July imports have not been published, but it appears the surplus of exports over imports

is higher than a rate of $400 million a year.

In the first seven months of this year, exports totaled $11.4 billion. This is an increase of $2 billion or 21 pct over the 1959 level. Imports for the first half of 1960 reached $7.36 billion. A 3 pct, or $204 million gain over last year.

Racine, Vickers Enter Intercontinental Pact

Racine Hydraulics and Machinery, Inc., Racine, Wis., is cross-licensing with Vickers—Armstrong, Ltd., major British metalworker.

The move means Racine Hydraulics will make the full line of Vickers hydraulic equipment in the U. S. Vickers will build and distribute Racine equipment in the British Empire and throughout the Outer Seven area of Europe.

The move gives Racine one of the broadest hydraulic lines offered by a U. S. Manufacturer.

At the same time, Racine announced it will begin operations through a Swiss based subsidiary, Racine Hydraulics, Ltd. It is expected to give the company a foothold on the growing European market.

Vickers-Armstrong will take over many of Racine's existing export sales outlets, but expects that it will expand its own sales force, both in Great Britain and abroad.

Congo Effects

As conditions in the Congo grow worse, it may mean a complete reappraisal of copper market trends. It can and probably will mean more American production.

It will also mean that South America will intensify negotiations to develop greater output and establish better relations with the U. S. The result of this will be increased imports here of South American ore.

When and if worst comes to worst, the Congo fracas will also mean more exploration in S. America and a more sensitive ear to projects formerly ignored in the U. S.

U. S. Imports Canada's Natural Gas

Canadian natural gas began flowing into the U. S. late last month when Trans-Canada Pipe Lines Ltd. completed its 51 mile extension from Winnepeg south to the international border near Emerson, Man.

Pipelines: International Weld

The gas is now being used for purging and testing sections of the Midwestern Gas Transmission lines now being built from the border to Marshfield, Wis.

When the Midwestern line is completed this fall, Trans-Canada will be selling about 204 million cu ft daily of Canadian natural gas for use in the Miswestern U. S.

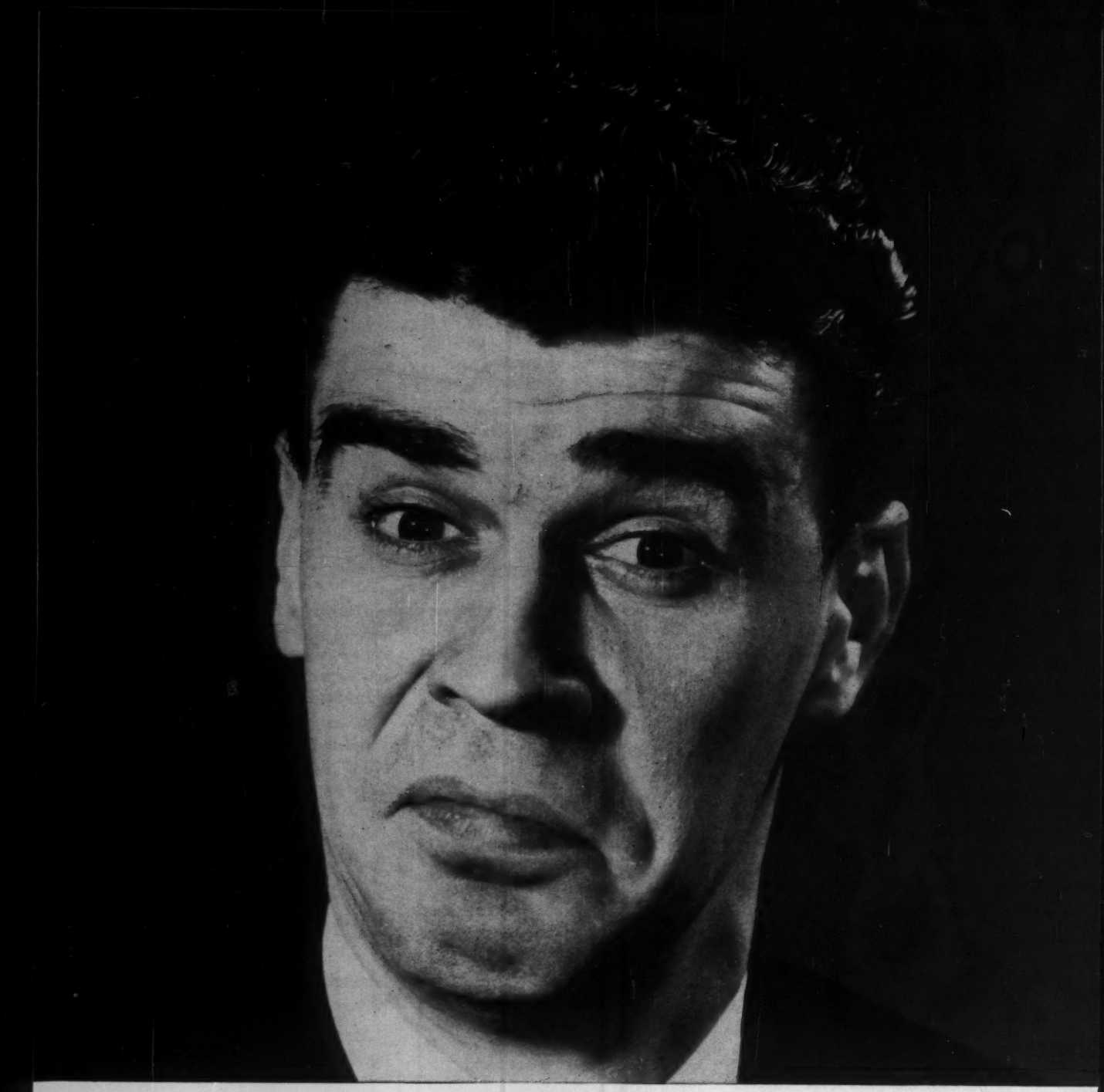
The tie-in weld (above) connecting the 30 in. diam. Canadian extension with Midwestern's line was made Aug. 23. Natural gas began flowing the same day.

Mexico Opens Up New Ore Source

Mexico has opened a new iron ore deposit to U. S. and Mexican interests and may pave the way for large mining operations there.

Until now, outsiders had to build blast furnaces there and ship pig rather than just take the ore out. The new contract for the deposit near Mazanillo is the first concession of its kind in modern history.

The policy change could well open up a flood of other cooperative ventures. And it could accelerate the integration of the West Coast steel industry.



"Two metalworking machines for the price of one?"

"I didn't believe it until a Ryerson machinery specialist showed me how.

"As a fabricator of stainless steel kitchen equipment, I was recently looking for a new squaring shear. I was considering one with a gap-type frame that would do my regular shearing, and an important notching operation as well. But when a Ryerson machinery specialist studied the problem, he recommended *two* pieces of equipment instead of one—at no increase in total cost. I got an underdriven shear and a universal metalworking machine that would do my notching plus many other jobs—adding versatility to my entire operation."

Why not have Ryerson study *your* machinery requirements? You'll get unbiased recommendations and a choice of 2800 different pieces of metalworking equipment. Joseph T. Ryerson & Son, Inc., Box 8000-A, Chicago 80, Illinois.

Quick-Release Bolts

New quick-release bolts combine the threaded advantages of a bolt with the features of a quick disconnect fastener. It fits in wherever speedy assembly or disassembly is necessary. Bolts are engaged or released by depressing a button that operates a spring-loaded mandrel. The mandrel holds a positive locked-in contact between the threads of a tapped hole and the threads on the quick-release bolt.

Controls Pipe Cropping

Non-contact X-ray gages insure precise cropping of seamless pipe end sections which fall below job-specified thickness. The X-ray unit, an electronic micrometer, accurately gages the pipe wall to within 1 pct of thickness. The gage controls a paint spray nozzle which marks the undersized areas, thereby establishing a proper crop point. Units check four lengths per minute.

Protects Steel Closures

Automakers are watching development of a vapor corrosion inhibitor that will protect large steel closures for at least 8 years. Potential use of the material involves storage of auto engines for periods up to one year.

Controls Pores in Metals

Porous metals are setting a new trend. Complex shapes as well as flat stock can be made with unprecedented control over pore size, pore distribution, ductility and liquid and air permeability. Materials can be multi-layered, sized or impregnated. Finished products can be welded, brazed, soldered, formed or machined. One use is a porous dome-like wind tunnel that permits flow through its nose at a rate six times faster than through its base.

Tools Boost Productivity

Typical of improvements in machine tools being exhibited at the Chicago exposition are three developments expected to up productivity in metalcutting operations from 300 to 700 pct. One is a dial-in system of machine control. The second item is a simple tape-controlled unit for boring, drilling and milling. The third is a grinder that represents a breakthrough in absolute cutting edge geometry on precision cutting tools.

Abrasive Gains Depth

New round pin and triangular pin abrasives point up added uses for barrel finishing. The new shapes finish the hard-to-reach areas of the parts. They are ideally suited for parts having holes, slots or serrations that require deburring.

More Explosive Forming?

Explosives have a great future in metalworking. They can be used to forge parts—of almost any size — to close tolerances. Explosives show promise as a means of forging aircraft and missile parts. Among the parts successfully forged are low-relief access doors and structural members made of integrally stiffened skin. These parts are explosive formed from 7075 and 2014 aluminum alloys. Water transmits the explosive force.

Crankcase Vent Cuts Sludge

A new crankcase ventilation system combats engine sludge formation—prolonging motor life and saving gasoline. The system, developed by AC Spark Plug Div., uses specially engineered crankcase vent valves plus tubing, clamps and adapters. It can be fitted into any engine. Unburned hydrocarbons, a source of air polution, are consumed in the system.

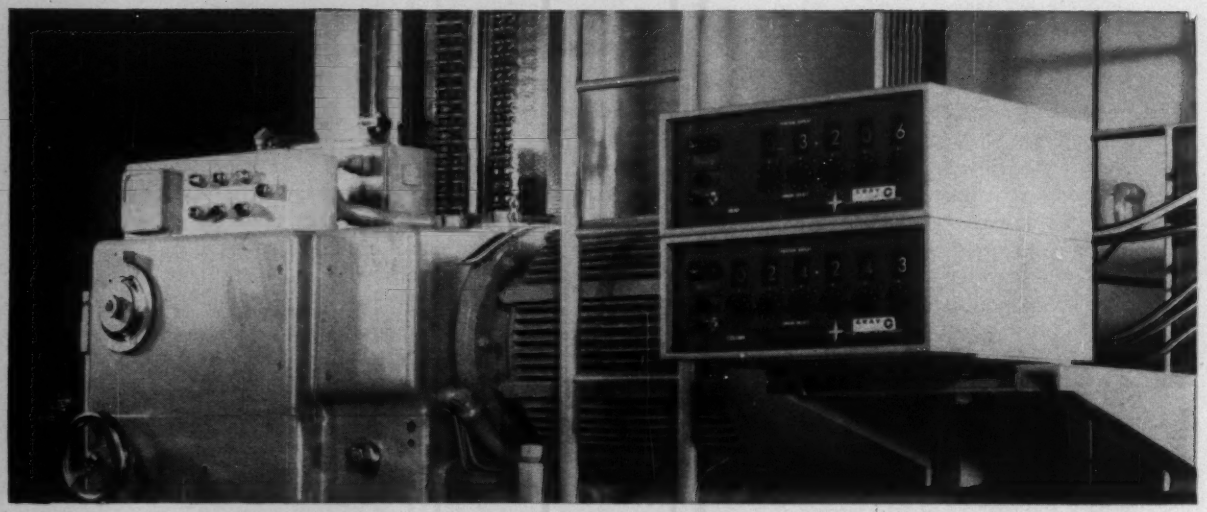
Welds Miniature Parts

A fully automated welding system assembles and welds up to 300 miniature electronic parts per minute. The continuous dial feed welder uses load stations to feed microscopic parts such as transistors, diodes and resistors. A motor-driven table carries two adapter plates containing the electrodes. The plates are aligned, one above the other, to provide perfect matching of paired or opposite electrodes. Component parts are fed and positioned automatically from a vibratory hopper.

NORDEN Modumatic Control for New and Existing Machines

Series 100 features

- ★ Actual Position Readout
- ★ Decimal Display
- ★ Full Range Origin Select



IF you have the time-consuming problem of rotary or linear positioning, then you are aware of the importance of knowing the exact location of the tool or the work piece. Up until now this was a tedious, time-consuming process requiring calculation and dial reading, both subject to human error. Norden's Series 100 display system eliminates all this and performs the calculations automatically. What's more, it can be installed on **new** and **existing** machines.

The Series 100 numerical control system utilizes a unique position feedback transducer, electronic circuitry and a visual display to indicate the **actual** position of the tool or work piece.

The **actual** position is displayed in straight decimal form by illuminated numbers that are readable from twenty feet. The display unit may be located on the machine or remote.

This Norden Modumatic system also offers a full range electronic origin select so that any desired offset can be quickly and easily dialed in by the operator on manual selector switches.

For more information about this position display system or other Modumatic control systems contact your nearest Norden Representative—400 Main Street, East Hartford, Connecticut, JAckson 8-4811, 11 West Monument Ave., Dayton 2, Ohio, BAldwin 8-4481, or write to us at the address below.

A new concept in Numerical Control

from ★ **NORDEN** ★ **DIVISION OF UNITED AIRCRAFT CORPORATION**

DATA SYSTEMS DEPARTMENT

COSTA MESA, CALIFORNIA

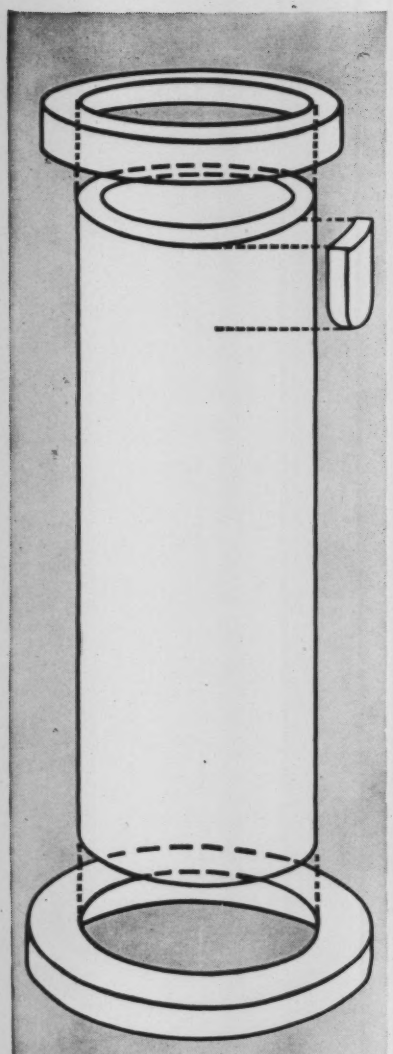
J & L Steel Service Centers—efficient and dependable. It's *extra* care that counts at The Department Store of Steel. Take the stock shown here. It's all carefully identified and protected—ready for slitting, shearing or roller-leveling to your exact specifications for immediate delivery. Add this to J & L's unparalleled expansion, new buildings, the latest machinery and equipment, increased stocks of steel, stainless and aluminum and you'll see why J & L customers today are getting faster, more efficient service.

Take advantage of the streamlined, time-saver service J & L offers. Count on The Department Store of Steel. You'll get exactly what you want—when you want it.

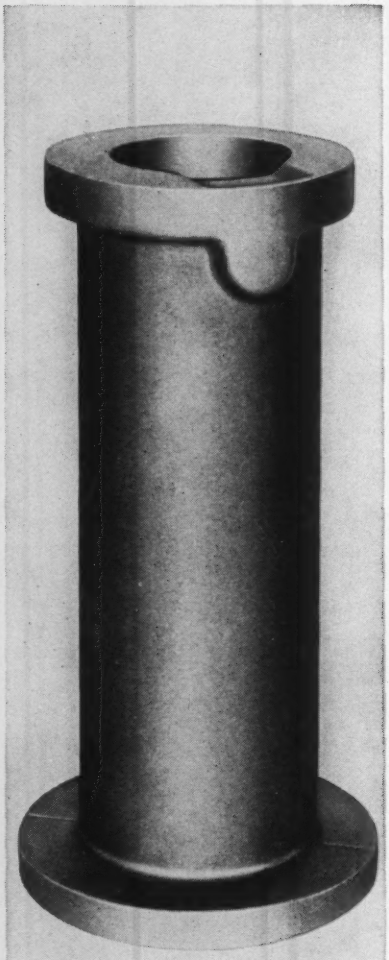
J & L Steel Warehouse Division

CHICAGO • CINCINNATI • CLEVELAND • DETROIT
HAMMOND • INDIANAPOLIS • LANCASTER • LOUISVILLE • MEMPHIS
NASHVILLE • NEW ORLEANS • NEW YORK • PITTSBURGH

Unusual 1-piece design replaces 4-part assembly



Schematic showing parts assembly of barrel blank weldment.



Externally upset tube includes unusual boss, eliminates three parts. Barrel blank from SAE 1020 seamless tubing 3¼" O.D. x 13/32" wall. Finished length 10.062". Finished weight 13 lbs. 2 oz.

COMMERCIAL exceeds the commonly accepted technique and specializes in unusual upset forging... combining advanced engineering with practical ingenuity. Here's how!

BARREL BLANK—Originally, the part was a weldment made from a tube, two flanges and a boss. Now, the complete barrel blank is "Task-Forged" by externally upsetting only one piece of tubing in a patterned die designed and developed by COMMERCIAL. This resulted in closer tolerances and less distortion than the previous method.

In addition, as an upset forging the part now possesses added tensile and torsional strength resulting from controlled grain flow while the metal is being displaced. Even more... the part now has a more efficient metal distribution.

Material saving: 15%. Reduced machining time: 30%. Overall customer benefit: a better, stronger part at less cost!

COMMERCIAL quality control assures a scale free machining surface by Hydra-Jet descaling stock before forging. And, Magnaglo® inspection double checks the finished forgings for internal seams, grain structure defects. Let the experience of COMMERCIAL's 30 plus years of producing top quality, unusual upset forgings work for you—to beat down unit costs while beating in tougher metal quality. Send print or prototype for study and estimate—no obligation.

Address: Commercial Shearing & Stamping Company, Dept. K-37, Youngstown 1, Ohio.

Magnaglo is registered trademark of the Magnaflux Corporation.

Specialists in the shape of things to come

COMMERCIAL shearing & stamping

LETTERS FROM READERS

The Full Story?

Sir—All of us here were pleased to learn from your August 18 issue that our friends at Steel Founder's Society of America are stepping up their sales clinic program for members. However, in describing the clinics your article stated, "They contrast in operation with the Gray Iron Founders' Society's clinics which are for users." This is not the full story.

In 1958, before we inaugurated the Gray Iron Castings Clinics for customers, we put on 10 intensive three-day regional sales training clinics from coast to coast for member company management and sales personnel. A total of 257 member representatives from 105 foundries participated. In 1959, and again in 1960, we did stage 29 regional one-day customer clinics which attracted 901 designers and purchasing agents from 453 customer companies.

This spring, we conducted four more three-day sales clinics for members, plus seven sales refresher clinics for 155 members from 81 foundries.

Both the member and the customer clinic programs have been well received by participants. Let's encourage more and more clinics in the metalworking field so that more salesmen and customers may have the opportunity to learn more about the basic metal-forming processes. —Donald H. Workman, Gray Iron Founders' Society, Inc., Cleveland, O.

For Purchasing

Sir—The article entitled, "Purchasing Teamwork Is Way to Lower Costs, Raise Profits," in the August 4 issue of The IRON AGE was very interesting.

Because the article discusses value analysis, is about purchasing by purchasing people, and because I am associated with purchasing and the National Assn. of Purchasing Agents, you might be disposed to assume bias on my part. Let me assure you that this is not so. I think it is a fine article, and this is not unusual for The IRON AGE. I am well aware of this fact having been a subscriber for many years.

More and more, managements are realizing the importance of the purchasing function and the substantial upgrading that is going on among our members. N.A.P.A. can take credit for a substantial portion of this improvement because of the fine educational programs being made available to our members, particularly our value analysis-standardization programs.

I am confident that a little research on your part will disclose that a high percentage of your readers would be interested in articles on purchasing, and particularly, on value analysis. — K. A. Cruise, Chairman N.A.P.A.

■ **We agree. We've carried a number of articles on value analysis and plan to continue to discuss this worthwhile subject.—Ed.**

Thrilled

Sir—We were very thrilled with the article on the field services of the Dept. of Commerce by P. J. Cathey. I have shown it to all our managers who are here in Washington attending meetings with the Export-Import Bank officials. We would like to have enough copies to send at least one to each of them. If you could send us an extra 50 copies we would certainly appreciate it.—Richard H. Krause, U. S. Dept. of Commerce, Washington, D. C.

■ **Copies have been mailed.—Ed.**

Of Interest

Sir—I found the article "Wages and Taxes in Western Europe" by J. J. Thackara in your August 11 issue of great interest. I would appreciate receiving two or three copies of the article if available.—L. G. Rattray, General Electric Co., Cleveland, O.

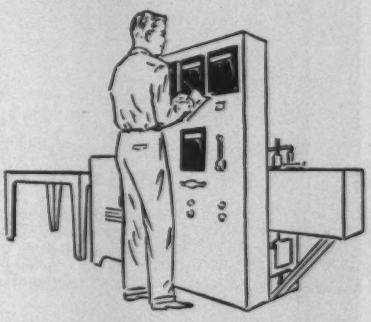
■ **Copies will be sent.—Ed.**

W. C. "BILL" PINE, Hayes Chief Metallurgist, reports . . .

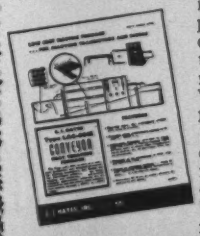
BRAZING CALLS FOR KNOW-HOW PLUS SHOW-HOW

Pioneer of controlled atmosphere heat treating, and developer of the *first* electric furnace for stainless steel brazing . . . Hayes today offers you one of the most extensive lines of furnaces and atmosphere generators for all types of metal bonding operations.

Hayes "KNOW-HOW" provides a customized brazing technique which takes into consideration every aspect of the job: Selection of alloys, placing and fixturing of work, choice of atmospheres, proper time-temperature cycles. Whatever the brazing application — from aluminum (900°F range) to platinum (3400°F range) — Hayes "SHOW-HOW" then proves the technique on full production-line equipment in our lab.



The Hayes answer to your brazing problem comes to you as a *complete package*. Our engineers provide free start-up service to duplicate laboratory results in your plant . . . fully instruct your staff to assure economical, maintenance-free brazing operations. The end product: a "Results Guaranteed" furnace-atmosphere combination that helps improve your product, increase production, and reduce costs. Write today for Bulletin 5711B describing typical conveyor-type brazing furnace.



C. I. HAYES, INC.

821 Wellington Ave. • Cranston 10, R. I.
Established 1905

ELECTRIC FURNACES

It pays to see **Hayes** for metallurgical guidance, lab facilities, furnaces, atmosphere generators, gas/fluid dryers.

Quantity
PRODUCTION
of
GREY IRON CASTINGS

*

ONE OF THE NATION'S
LARGEST AND MOST MODERN
PRODUCTION FOUNDRIES

*

ESTABLISHED 1866

THE WHELAND COMPANY

FOUNDRY DIVISION

MAIN OFFICE AND MANUFACTURING PLANTS

CHATTANOOGA 2, TENNESSEE

FATIGUE CRACKS

The Road Ahead

In this issue appears the first of a series of three articles (p. 67) that should help you advance to a bigger and better position in your company. Or, they might tell you to stop trying—and to happily make the most of your present position. It seems there are a lot of executives who are as far advanced as they should go.

In the Know—The article series is written especially for IRON AGE readers by Dr. Frederick J. Gaudet of Stevens Institute of Technology. Dr. Gaudet is one of the country's leading industrial psychologists. He probably knows more about what makes executive successes and failures than any other man in the U. S.

You'll learn some surprising things about personal success in business. Some long-held notions have been disproved by recent research.

Latest Findings—Even psychologists have been surprised by findings of recent research approaches. They have learned more about what makes executives tick by taking a hard look at executive failures. Dr. Gaudet has pioneered this approach.

Again, we say, this article series should help you any way you look at it. After reading the articles, you may have good leads as to how to equip yourself to move ahead. On the other hand, you may learn to accept your present lot and, what's more, be happy with it.

For Survival

Bomb shelters, once considered a pessimist's possession, are fast becoming an important part of the home. In fact they're selling at a rate that even has producers surprised. Wonder Building Corp., Chicago, was setting up a display of new shelters in a Chicago hotel and before the exhibit was opened three shelters were sold to passers-by.

Real Reasoning — One reason perhaps is that Wonder and U. S. Steel have come up with shelters that are economical and offer maximum safety from radiation. Small units, containing 900 lb of sheet steel, sell for $295. Larger shelters, using 2500 lb of sheet and floor plate, retail at $1195.

Wonder says inquiries are coming in at the rate of 10 a day. And the company is shooting for 100 to 200 units a week by early next spring. There are other signs that the shelter may have hit the market at just the right time.

SURVIVAL: New bomb shelters are assembled easily and offer maximum protection.

Survival Room—Home builders are including them in their initial plans. One 1500-home development project offers a basement shelter with each dwelling. And homeowners are buying hand blowers from home workshop forge sets at a rate that has put manufacturers as much as four weeks behind in deliveries. The blowers are used as air pumps in shelters.

The Office of Civil Defense is buying seven of the Wonder shelters. If an attack comes, local CD will be directed from them.

CAR HEARTH FURNACES

FOR

HEAT TREATING
STRESS RELIEVING
ANNEALING
HOMOGENIZING
600°F TO 2500°F

DIRECT FIRED OR FORCED CONVECTION, OIL, GAS, ELECTRIC

R-S CAR HEARTH FURNACES are batch type furnaces with movable hearth for ease of loading and unloading. They can be designed to your specifications as direct fired units for temperature range from 1000° to 2500°F. or as forced convection units from 600° to 1600°F.

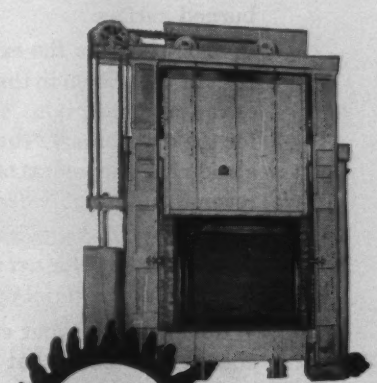
R-S CAR HEARTH FURNACES can be built to utilize oil, gas or electricity, whichever is the most economical for your plant. Whatever the charge weight, length or width required R-S engineers can design and build the furnace to meet your requirements most efficiently.

R-S CAR HEARTH FURNACES have proved themselves throughout the world. In foundries for heat treatment of steel and iron castings. In metal working plants for stress relief of weldments, annealing, normalizing, spherodizing and forging, or to heat for rolling, forming, or forging.

For full details on R-S Car Hearth Furnaces write to...

R-S FURNACE CO., INC.

NORTH WALES, PA.

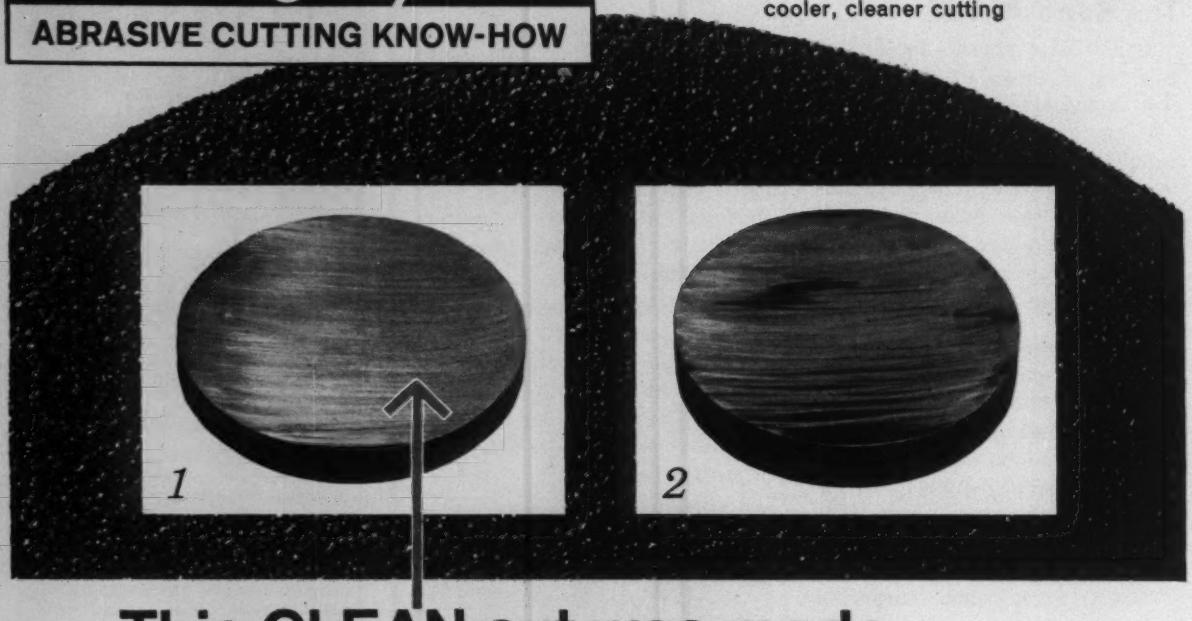


R-S FURNACES

Allison-Campbell

ABRASIVE CUTTING KNOW-HOW

Close-up view of resinoid wheel shows rough texture that provides cooler, cleaner cutting

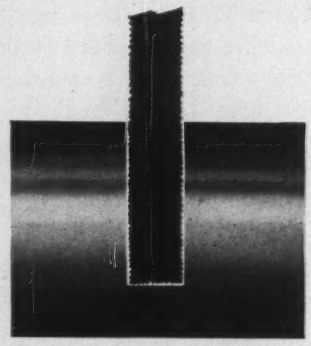


This CLEAN cut was made with a ROUGH-SIDED wheel!

1 • **THE SPECIMEN ON THE LEFT ABOVE** was cut from a 3¾" diameter hardened steel bar in just 28 seconds with an ALLISON *rough-sided* dry abrasive cutting wheel like the one shown in the background. Note that the cut is clean and practically burn-free.

2 • The specimen on the right was cut under the same conditions and with a wheel of the same formulation, but *without* rough sides. The result—the cut took 30 seconds and produced a badly burned surface.

3 • The secret is the extra clearance the rough sides give *inside* the cut (as shown in the small picture at right), and the resulting *cooler* cutting action. This adds to wheel life, too. That's why, for the dry abrasive cutting of solid bars, heavy-wall tubing and structural shapes, ALLISON-CAMPBELL field engineers generally recommend rough-sided wheels.



3 Inside the cut, rough-sided wheels give extra clearance, extra cooling for faster cutting and to prevent burning

For dry cutting of thin-wall tubing with minimum burr, a fine-grit, *smooth-sided* wheel is the choice. And for *wet* abrasive cutting, dozens of ALLISON wheel specifications are available to match the material you are cutting, the quality you require, and the cut-off machine you use.

Regardless of your cut-off problems, your ALLISON-CAMPBELL field engineer can help you choose the wheels that will give the results you want. He is an abrasive cutting specialist—use his know-how.

Write for **Bulletin DH-214A** *for details on the complete line of ALLISON wheels*

ACCO

ALLISON ABRASIVE CUTTING WHEELS

Allison-Campbell Division • American Chain & Cable Company, Inc.

927 Connecticut Avenue, Bridgeport 2, Conn.

COMING EXHIBITS

Machine Tool Exposition — Sept. 6-16, International Amphitheatre, Chicago. (National Machine Tool Builders Assn., 2139 Wisconsin Ave., Washington 7, D. C.)

Production Engineering Show — Sept. 6-16, Navy Pier, Chicago. (Clapp & Poliak, Inc., 341 Madison Ave., New York 17.)

Coliseum Machinery Show — Sept. 7-15, Chicago. (Contact: A. B. Perkins, 2216 South Hill St., Los Angeles 7, Calif.)

Iron & Steel Show — Sept. 27-30, Cleveland Public Auditorium, Cleveland, O. (Association of Iron & Steel Engineers, 1010 Empire Bldg., Pittsburgh 22.)

Metal Show—Oct. 17-21, Convention Hall, Philadelphia. (American Society for Metals, Metals Park, Novelty, O.)

Die Casting Exposition & Congress —Nov. 8-11, Detroit Artillery Armory, Detroit. (The Society of Die Casting Engineers, 19382 James Couzens Highway, Detroit 35.)

MEETINGS

SEPTEMBER

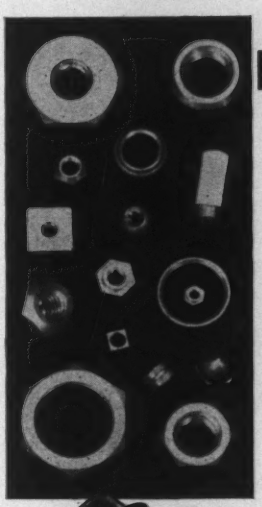
Assn. of Lift Truck & Portable Elevator Mfrs.—Fall meeting, Sept. 12, The Cavalier Club, Virginia Beach, Va. Association headquarters, One Gateway Center, Pittsburgh 22, Pa.

Electronic Industries Assn. — Fall conference, Sept. 13-16, French Lick-Sheraton, French Lick, Ind. Association headquarters, 1721 DeSales St., N. W. Washington, D. C.

American Die Casting Institute — Annual meeting, Sept. 14-16, Edgewater Beach Hotel, Chicago. Institute headquarters, 366 Madison Ave., New York.

National Foundry Assn. — Annual meeting, Sept. 22-23, Edgewater Beach Hotel, Chicago. Association

Fischer



produces "specials" every day!

When applied to precision nuts, "special" denotes more than just non-standard sizes, shapes and threads. It also means that advanced production facilities, specialized quality controls and extensive experience are necessary to produce and supply uniformly accurate custom nuts.

With production records on more than 3,457 different types of special nuts . . . both brass and aluminum . . . Fischer is capable of mass producing turned nuts to *your* exact specifications. In fact, all Fischer nuts are made to closer tolerances than required by American Standard B18.2-1955 specifications.

As the leading producer of turned nuts, Fischer also specializes in dependable "on schedule" deliveries and competitive pricing. Whatever your requirement, let Fischer quote on your next order for precision nuts . . . standards, specials or miniatures.

TURNED NUTS Fischer SPECIAL MFG. CO. CINCINNATI OHIO SINCE 1908

FOR DETAILS, WRITE FOR CATALOG FS-1000 AND PRICE LISTS.

there's no premium for precision at Fischer

FISCHER SPECIAL MFG. CO.
445 MORGAN STREET • CINCINNATI 6, OHIO

3304-FS

What Would
75% PAINT SAVINGS
Mean in YOUR Finishing Department?

Designed for the New Decade—Beautifully styled BAL HARBOUR line of aluminum furniture by AFCO was winner of the 1960 Apollo Award for pre-eminence in design. The uniform, high quality finish is applied electrostatically with the Ransburg No. 2 Process Hand Gun.

Faster . . . Cleaner . . . Cheaper—The "wrap-around" feature of the No. 2 Process Electrostatic Hand Gun paints all areas of this type of work from one side only, providing a 75% paint savings and a 700% increase in production volume over former air hand spray.

RANSBURG

Ransburg No. 2 Process Electrostatic Hand Guns are providing a 75% paint savings in the painting of beautiful AFCO aluminum furniture.

AFCO Aluminum Furniture Co., Inc., Miami, Fla., replaced hand spray with two Ransburg Electrostatic Hand Guns. Along with paint and labor savings, quality of the work was improved with greater uniformity. And, production volume was increased a healthy 700%! Formerly, they were painting approximately 100 items a day. NOW, with the faster, cleaner Electrostatic Hand Guns, they paint from 700 to 800 pieces per day. Electrostatic is faster because the "wrap-around" characteristic of Electro-Spray paints all areas of this type of work with a pass from one side only.

NO REASON WHY YOU CAN'T DO IT TOO

Write for information and literature about this revolutionary, new painting tool. See how the Ransburg Electrostatic Hand Gun can save time . . . paint . . . and cut costs in YOUR finishing department. If your production justifies, it'll pay you to investigate Ransburg's *automatic* electrostatic spray painting equipment. Write for our No. 2 Process brochures which show numerous examples of modern production painting in both large and small plants.

RANSBURG Electro-Coating Corp.
Box 23122, Indianapolis 23, Indiana

MEETINGS

headquarters, 53 W. Jackson Blvd., Chicago.

Porcelain Enamel Institute, Inc.—Annual meeting, Sept. 25-28, The Greenbrier, White Sulphur Springs, W. Va. Institute headquarters, 1145 19th St., N. W., Washington, D. C.

Farm Equipment Institute—Annual convention, Sept. 25-28, The Statler Hilton Hotel, Dallas, Tex. Institute headquarters, 608 S. Dearborn St., Chicago.

American Welding Society — Fall meeting, Sept. 26-30, Penn-Sheraton Hotel, Pittsburgh. Society headquarters, 33 West 39th St., New York.

OCTOBER

Metal Lath Mfrs. Assn.—Fall meeting, Oct. 6-7, The Greenbrier, White Sulphur Springs, W. Va. Association headquarters, Engineers Bldg., Cleveland.

The Electrochemical Society, Inc.—Fall national meeting, Oct. 9-13, Shamrock Hotel, Houston, Tex. Society headquarters, 1860 Broadway, New York.

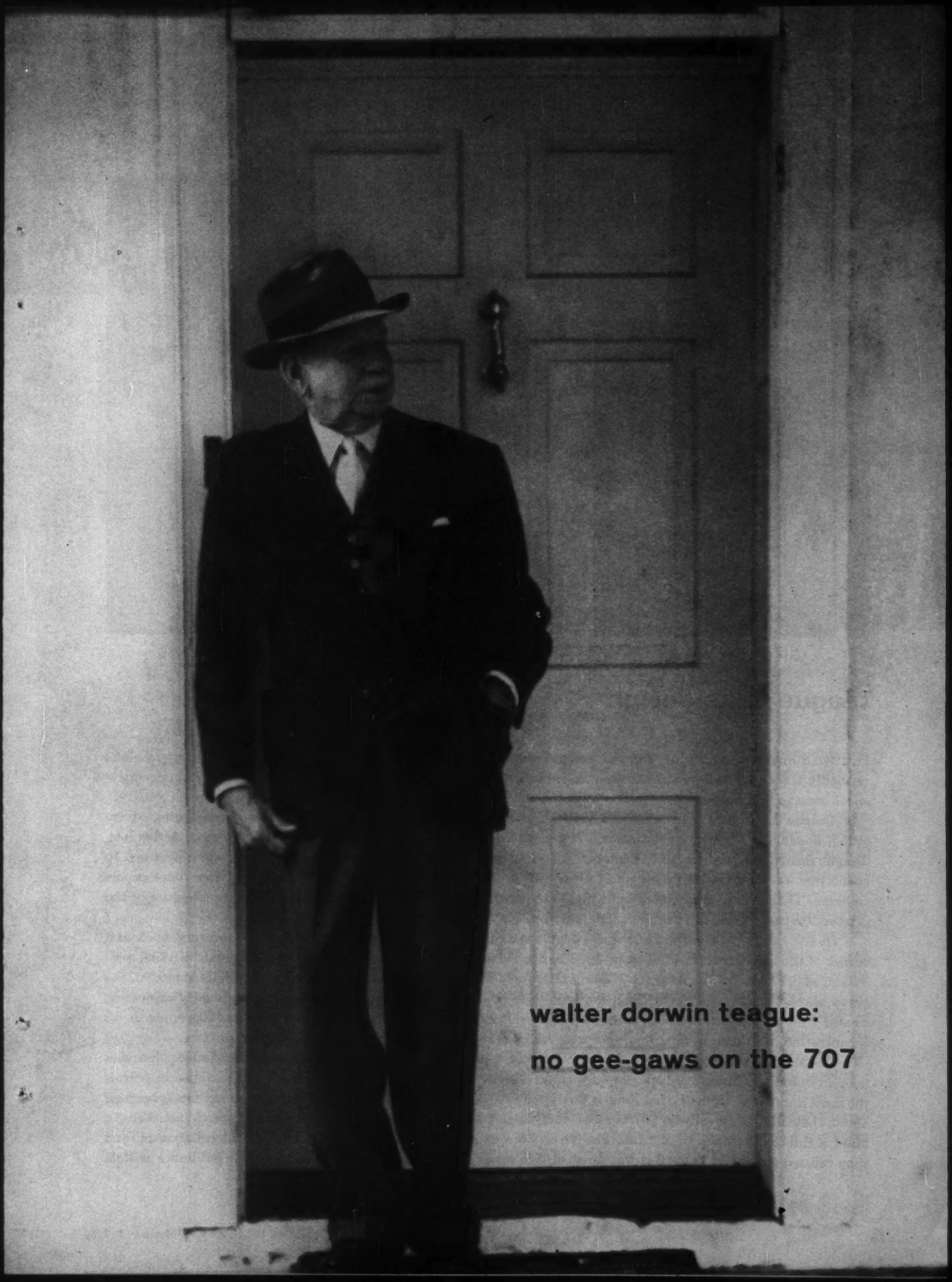
American Gas Assn.—Annual convention, Oct. 10-12, Atlantic City. Association headquarters, 420 Lexington Ave., New York.

Pressed Metal Institute — Annual meeting, Oct. 10-14, Shawnee Inn, Shawnee-On-Delaware, Pa. Institute headquarters, 3673 Lee Rd., Cleveland.

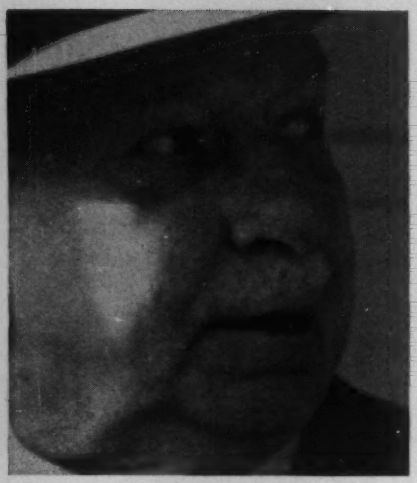
Marking Device Assn. — Annual convention, Oct. 12-14, Hotel Roosevelt, New York. Association headquarters, 912 Chicago Ave., Evanston, Ill.

Steel Boiler Institute, Inc. — Fall meeting, Oct. 12-14, The Greenbrier, White Sulphur Springs, W. Va. Institute headquarters, 1308 Land Title Bldg., Philadelphia.

Gray Iron Founders' Society, Inc.—Annual meeting, Oct. 12-14, Netherland Hilton Hotel, Cincinnati. Society headquarters, 930 National City-E. 6th Bldg., Cleveland.



walter dorwin teague:
no gee-gaws on the 707



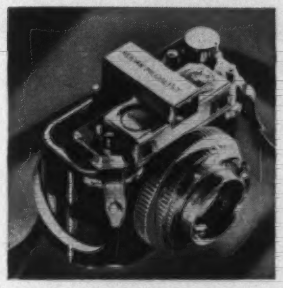
teague talks design

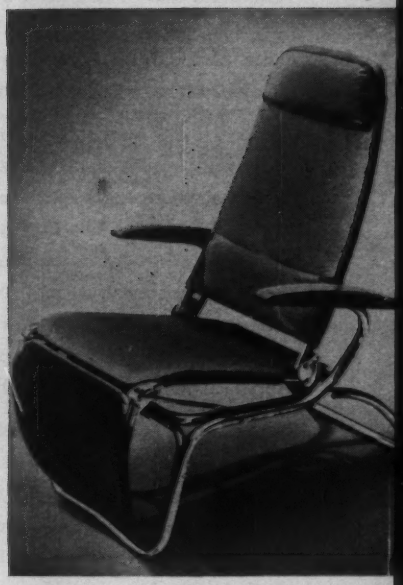
In 1942 a man named Walter Dorwin Teague published "You Can't Ignore Murder," a mystery novel. It is probably the only attempt at bafflement in his long history, because Walter Teague has been making products speak clearly for themselves since the Twenties.

Teague has rightly been called the dean of industrial design. He began as an artist in 1908 designing advertising, books and magazine illustrations. If you're old enough to remember Locomobile and Pierce Arrow ads, Teague designed them. In 1927, Eastman Kodak asked him to redesign their cameras. He made a proposal to spend one week a month in their plant observing production problems and techniques, and *then* redesign the cameras. That simple principle of knowing how a product is made, of understanding all the complexities of the production line, is still a Teague trademark. And Eastman Kodak is still a Teague client.

In the thirty-plus years since that camera assignment, Teague has explored just about every nook and corner of the wonderful world of three dimensions. He designed the classic Marmon 16 automobile in 1930, with his son as collaborator; he was on the Design Board of the 1939 World's Fair. When World War II exploded, the Navy asked Teague to perform design work on their 16-inch guns in order to eliminate possibilities of explosions caused by loading malfunctions. Today he still works for the Bureau of Ordnance. He has 120 people in his organization, a branch in San Juan and task forces scattered across the United States

Teague has designed service stations, railway equipment, plane interiors, heating appliances, business machines and machine tools, offices and furniture, showrooms and department stores, even periodicals. One of the most impressive things he has done is the Boeing 707 jet interiors. Mr. Teague recalls: "Boeing was concerned about their ability to sell the 707 because they hadn't made civilian planes for years. We convinced them to build a full-size mockup of the interior. They gave us *carte blanche* with body engineers to collaborate, and they refused to look at it until it was finished. We made it complete to the tiniest detail. It cost half a million





dollars and helped in selling most of the huge fleet now in the air. Our staff is responsible for the final interiors of the planes purchased by eighteen or more airlines, and for the interiors of executive planes purchased by the United States Government."

Whether mammoth jet airliners or chairs, a product is designed to five principles that are the *modus operandi* of the Teague organization. "First of all, the redesigned product has to work better for our efforts," Teague says. "It should be more convenient to use, more humanized. It must make honest use of the material it's made of, and it's got to be capable of being efficiently manufactured at the proper price. We assiduously avoid gee-gaws or extraneous ornamentation that adds nothing but price to the product. Finally, the design must give the user an emotional pleasure or gratification each time it is used." Selection of the right material for the job is important to each of Teague's requirements. "We endorse no material over another," Teague says. "We first look for the material that is best in keeping with the product's desired personality. Strength and durability are highly important in material selection. Then we make sure our client's tooling can handle the material we have in mind. Above all, it takes the right material to sell the product to the consumer."

Teague has used practically all materials known to man and it is no accident that a great many of his designs use steel in one way or another. "The wonderful thing about steel is its versatility," says Teague. "Its many alloys, old and new, give it adaptability that other materials don't have. Its strength, both in tension and compression, qualifies it for literally thousands of uses. And stainless steel is another reason why steel is a modern metal because it gives so many designs their contemporary look."

The moral is this: steel is an ageless metal, as much at home in the Boeing 707 and today's elegant tableware as it was in medieval days. Its enduring modernity will always be recognized and used by designers like Walter Dorwin Teague.

USS TRADEMARK **United States Steel**

designing with stainless steel

The ideal design has been described as one in which the properties of the material are fully utilized in the finished product. This ideal is difficult to achieve, and no group of materials comes as close to permitting this ideal as stainless steel.

To put it differently, no other material combines so many outstanding properties as the stainless steels. Stainless steels have high tensile strength. All are hardened and made even stronger by cold working. As a family they offer superb resistance to the corrosive effects of an enormous variety of reagents. They have unusual resistance to high temperature oxidation, and are distinguished by relatively low heat conductivity. And on top of their remarkable physical properties, stainless steel's lustrous appearance and sales appeal scarely need mention.

There are over 30 types of stainless steel today.

The history of stainless steel's use is marked by designers who turned a healthy profit with a quality material but mainly with sound ideas. They're the men who used stainless for its strength and sales appeal in toaster covers, its appearance and machinability in wrist watches, its structural properties and cleanability for truck trailer parts. Stainless steel cuts weight and adds years to the life of architectural panels; its corrosion resistance and smooth, pocket-free surface have made it the standard of the dairy industry. There are literally thousands of applications of stainless steel in which designers have utilized one, two or more of the remarkable properties of stainless steel.

By reflecting the color of its surroundings, stainless steel contributes to harmonious design.

Types 302, 410 and 430 make up 75% of stainless steel's uses.

Good design is honest design, whether it uses stainless steel or other materials. Yet the fact remains that there is no other commercial material quite as versatile as stainless steel. The applications shown on these pages are just a few of the hundreds of uses to which stainless is put every day. To learn more about stainless steel and its design properties, call our nearest sales office or write United States Steel, 525 William Penn Place, Pittsburgh 30, Pa.

Successful designers don't substitute stainless steel sections for sections of other materials. They design to stainless' unique properties.

Good design doesn't stop with function and sales appeal. It must also be capable of economical manufacture. As a comprehensive guide, send for the free book described at the right.

Stainless steels represent but a few of the thousands of grades of steel in existence today. United States Steel makes a complete line of stainless steels as well as alloy, high strength and carbon steels. Bring your design problems to us.

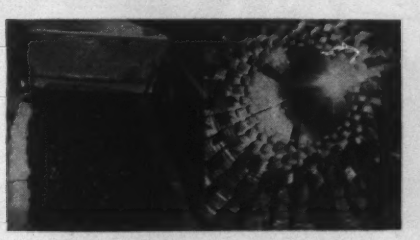
USS is a registered trademark

USS United States Steel

No Material comes close to stainless steel's versatility. By way of illustration, here are a few "opposites" that prove our point.

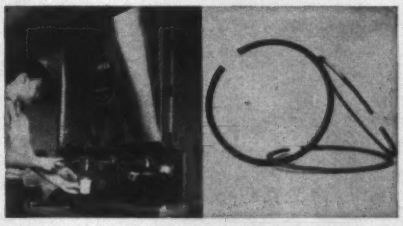
HOT. Temperatures in a jet afterburner reach 1400°F.

COLD. Stainless heat exchanger operates at temperatures as low as —443°F.



WET. Combination of moisture and coal would corrode nearly anything but stainless.

DRY. Rotary dryer is used to dry pharmaceutical ingredients.



CLEAN. Milk dispensers of stainless steel prevent contamination.

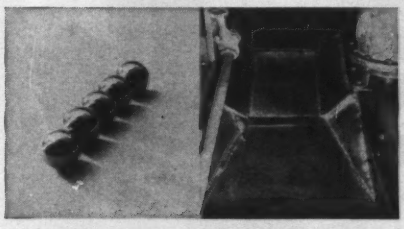
DIRTY. Stainless piston rings resist high temperature corrosion.

INSIDE. Chemical tanker needs simple wash-out for cleaning.

OUTSIDE. Stainless automobile trim stays bright and good-looking.

LIGHT. Stainless steel jewelry has a light, graceful appearance.

HEAVY. Strength and hardness of stainless combine to make safe doors safe.

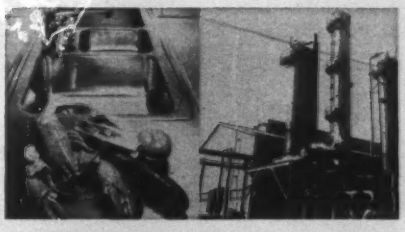


ROLL. Stainless ball bearings take a lot of punishment.

SLIDE. Abrasion resistance of stainless steel makes chutes last longer.

FORM. Stainless steel wrist watch keeps time and beauty.

FUNCTION. Stainless steel muffler defies heat with silence.



WATER. Stainless sinks stay bright and beautiful.

FIRE. Stainless steel shingles inside cat crackers are red hot.

This mark tells you a product is made of modern, dependable Steel.

Stainless steel's properties require close control over processing and in some cases, special fabricating techniques. Its cold working and joining characteristics are of special interest to the designer and will often influence final design. For complete coverage of the subject, send for your free copy of our newly revised manual:

FABRICATION OF USS STAINLESS STEEL

Welding Austenitic Stainless Steels
Welding Ferritic Stainless Steels
Welding Martensitic Stainless Steel
Brazing
Joint Preparation
Jigs and Fixtures
Removal of Scale from Stainless Steels
Soldering
Joint Design
Lining of Vessels
Riveting
Machining
Cold Cutting
Flame Cutting
Cold Forming
Hot Forming
Annealing
Scale Removal
Passivation
Standard Mill Finishes
Surface Finishing
Grinding, Polishing and Buffing
Etching
Protection of Stainless Surfaces
Cleaning of Stainless Steels

United States Steel
Room 6141
525 William Penn Place
Pittsburgh 30, Pa.

Send me your new, just-off-the-press "Fabrication of USS Stainless Steel."

Name_____

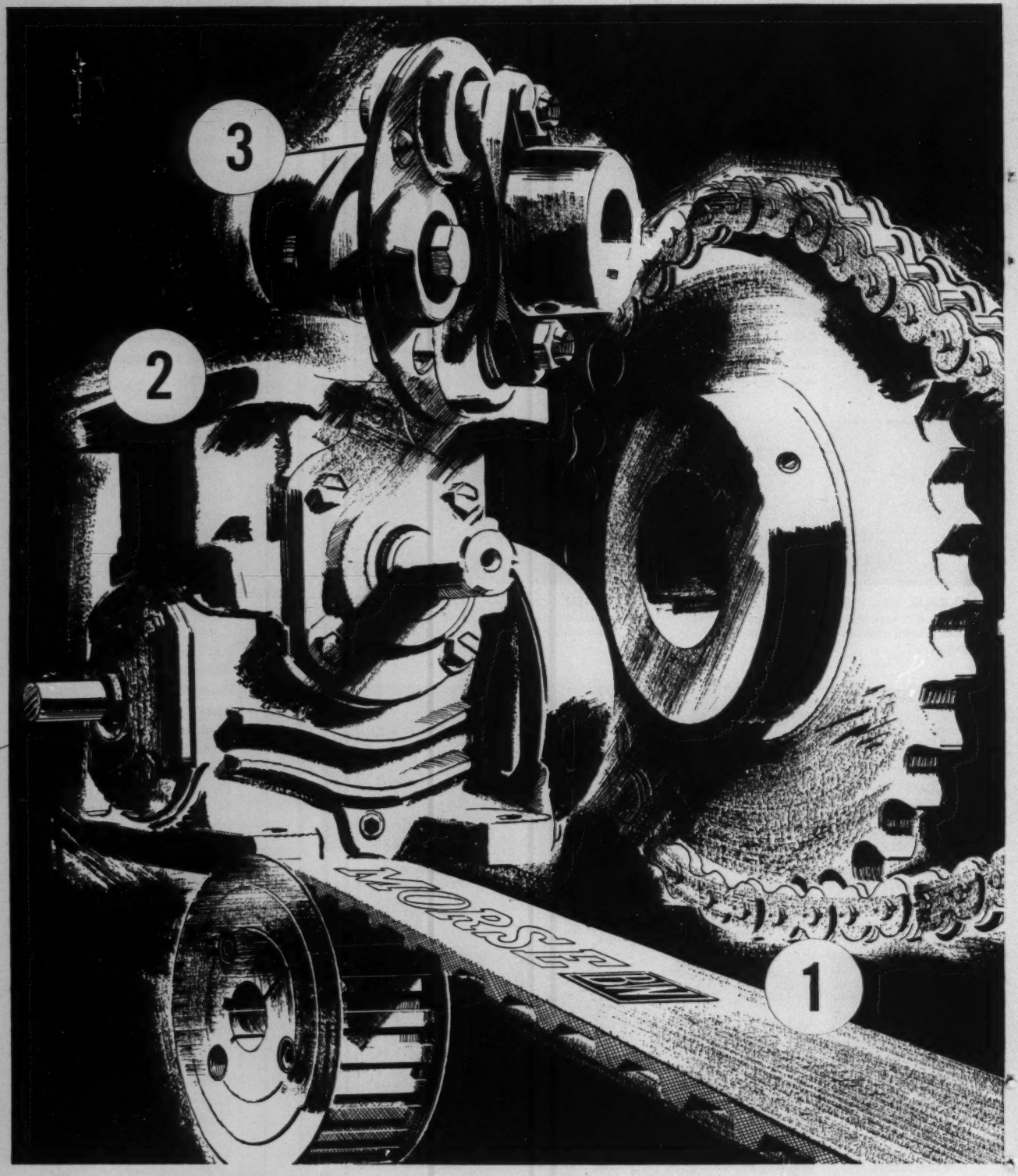
Title_____

Company_____

Address_____

City_____

Zone____ State_____



ONLY MORSE OFFERS ALL 4

1 BASIC DRIVES

Morse offers a complete line of Roller Chain, Silent Chain, exclusive Hy-Vo® Drives, "Timing"® Belts and Sprockets.

2 SPEED REDUCERS

Eberhardt-Denver "RW" PoweRgear® Reducers, Gearmotors, Worm Gear Reducers, Conveyor Drives, Mitre Boxes, Helical Reducers.

3 COUPLINGS

Flexible Roller and Silent Chain Couplings; Morflex Couplings, single and double; Morflex Radial and Marine Couplings.

4 CLUTCHES

Morse Cam (Over-Running, Back Stopping, Indexing), Pullmore, Over-Center, Torque Limiter and Centrifugal Styles afford flexible control of power.

Only Morse offers all 4 . . . only Morse can accept

Full responsibility for your industrial power drive

Drives, speed reducers, couplings and clutches . . . designed better, built better, distributed better and backed by the only company that takes on the whole job of satisfying you

If you have a production process that requires transmission of mechanical power, it just makes good sense to deal with a company that can take on the *whole* job—furnish *all* the components—guarantee your satisfaction with the *complete* power train.

And *only* Morse can do it!

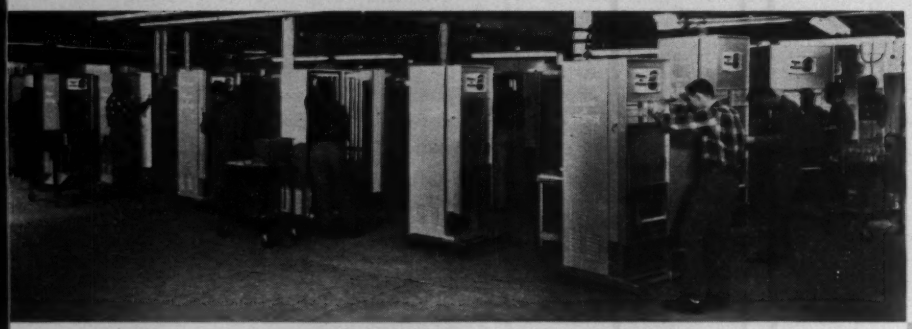
Drives, speed reducers, couplings and clutches: Morse designs them better to work together . . . builds them better to high quality standards for longer life, in a wide variety of sizes and capacities ideally suited to any job. Moreover, Morse distributes them better for broader, faster customer availability.

Morse—the No. 1 supplier of automotive timing chains—has, through continuous expansion, evolved a complete line of exclusive power-transmission products. Among them, the well-known Morflex couplings . . . H-E roller chain . . . Hy-Vo® drives . . . Rockford Clutches, Eberhardt-Denver speed reducers and full line of components for the broad industrial fields.

Whether your next project calls for a single coupling or a complete power train, your Morse distributor is the man who can help you most. He's always nearby, listed in the Yellow Pages. Or, if you wish, write direct: Morse Chain Company, Dept. 33-90, Ithaca, New York. Export Sales: Borg-Warner International, Chicago 3, Illinois. In Canada: Morse Chain of Canada, Ltd., Simcoe, Ontario.

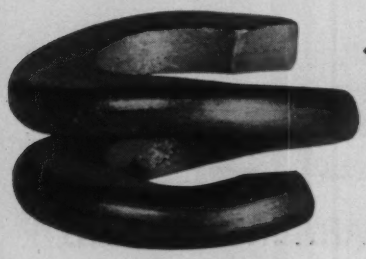
MORSE B-W

A BORG-WARNER INDUSTRY

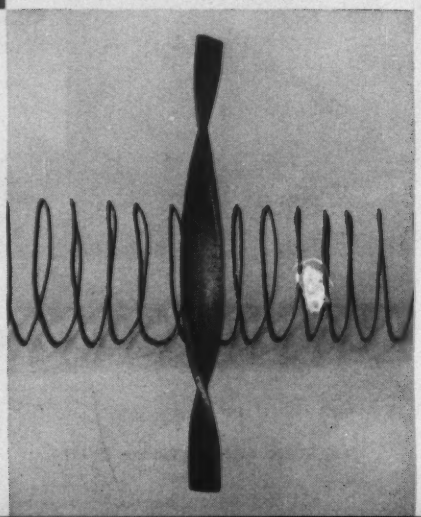


EXCELSIOR FOUNDRY COMPANY profits from the ductility and machinability of Republic's Chateaugay Pig Iron. Superior ductile iron castings are assured by the base metal's high total carbon content with unusually low percentages of manganese, phosphorus, sulphur, and subversive elements. Excelsior produces flaw-free castings that are accurate to patterns and shapes. Return coupon for data.

CHOICE VEND DIVISION, The Seeburg Corporation, uses Republic Electro Paintlok Steel Sheets for exterior panels on soft drink vending machines. Paintlok Sheets are ideally suited for this service. They are zinc coated by the electrolytic process and chemically treated at the mill to provide an inert phosphate base for paint, lacquer, or enamel. Final finish is held in a permanent mechanical bond. Sheets available in widths to 60 inches, thicknesses from .0088 to .1083.



EATON MANUFACTURING COMPANY, Reliance Division, draws Republic Hot Rolled Alloy Steel into lock washers for railroad track joints. These washers minimize rail movement yet are resilient enough to prevent frozen joints. The high quality of Republic Alloy Steel helps assure conformance to American Railroad Association specifications. At the same time, it has minimized scrap loss.



...Vlchek uses Republic Carbon Steel

A high volume manufacturer, Vlchek Tool Company, Cleveland, Ohio, has been producing quality mechanics' tools since 1895.

They forge three top grades of Republic Hot Rolled Carbon Steel—C-1040, C-1068, and C-1080—into pliers, end wrenches, chisels, punches, hammers, and other tools. Reject rate, according to Vlchek, is at an all-time low.

Republic combines unsurpassed quality control with the most advanced features of bar mill design. As the nation's largest supplier of forging quality carbon, alloy, and stainless steels, and forging quality titanium, Republic offers a complete range of sizes, shapes, and types.

Information on Republic bar products is available from your nearby Republic representative. Or, use the coupon below. You may wish to inquire into the obligation-free assistance offered by Republic's 3-Dimensional Metallurgical Teams.

SEE OUR EXHIBIT
Steel Arena
1960 METAL SHOW
PHILADELPHIA
OCT. 17-21
BUILD IT BETTER WITH AMERICA'S STEEL

REPUBLIC STEEL

REPUBLIC STEEL

World's Widest Range
of Standard Steels and Steel Products

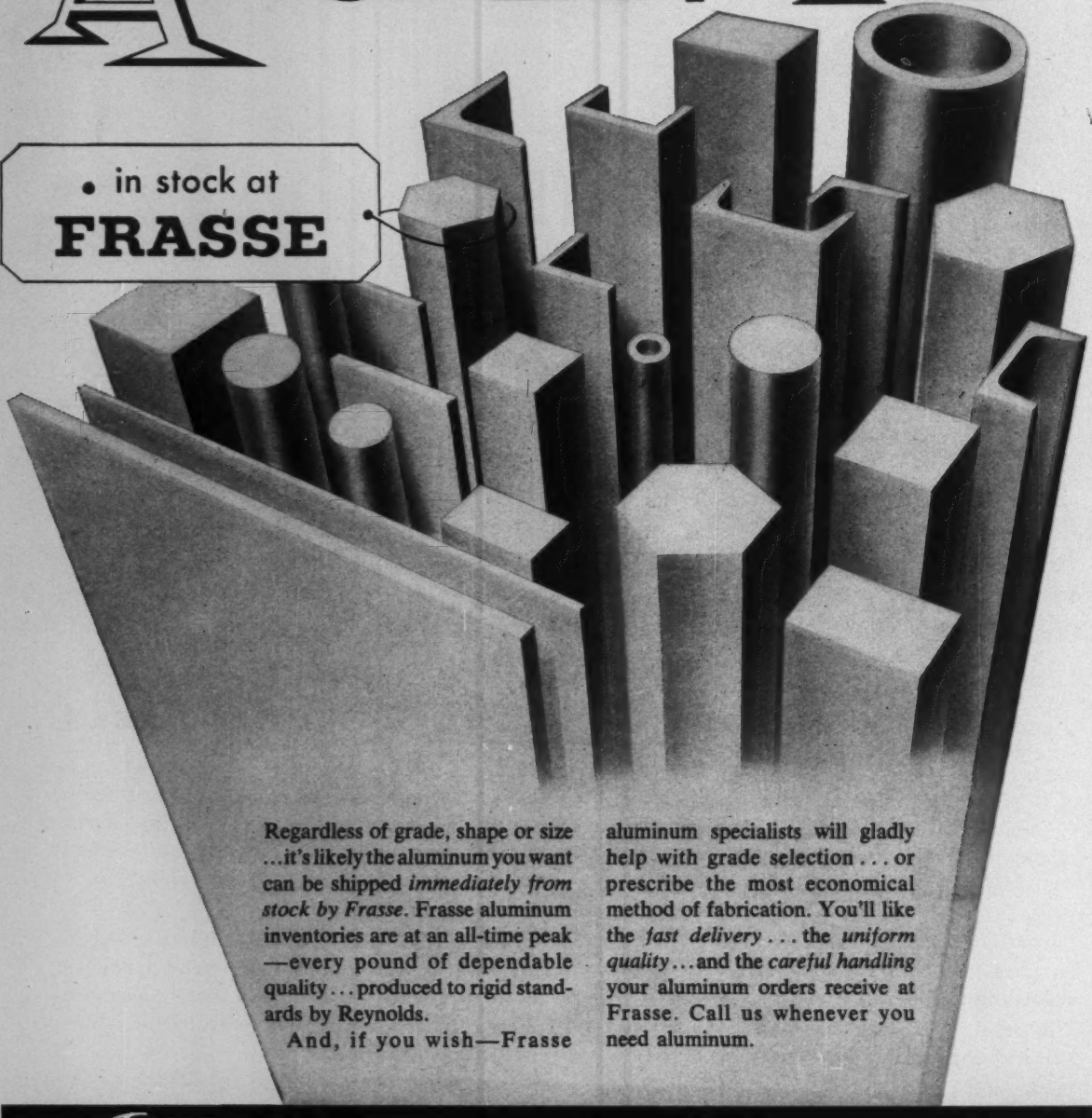
REPUBLIC STEEL CORPORATION
DEPT. IA-9865
1441 REPUBLIC BUILDING • CLEVELAND 1, OHIO

Please send data on:
☐ Hot Rolled Carbon Steel ☐ Chateaugay Pig Iron
☐ Hot Rolled Alloy Steel ☐ Republic Electro Paintlok® Sheets

Name_____ Title_____
Company_____
Address_____
City_____ Zone____ State_____

ALUMINUM

• in stock at
FRASSE



Regardless of grade, shape or size ...it's likely the aluminum you want can be shipped *immediately from stock by Frasse*. Frasse aluminum inventories are at an all-time peak —every pound of dependable quality... produced to rigid standards by Reynolds.

And, if you wish—Frasse aluminum specialists will gladly help with grade selection... or prescribe the most economical method of fabrication. You'll like the *fast delivery*... the *uniform quality*... and the *careful handling* your aluminum orders receive at Frasse. Call us whenever you need aluminum.

FRASSE for ALUMINUM

Rod • Bar • Wire • Sheet • Plate • Structurals • Extrusions
Tubing • Holobar • Pipe • Valves • Fittings • Tool and Jig Plate

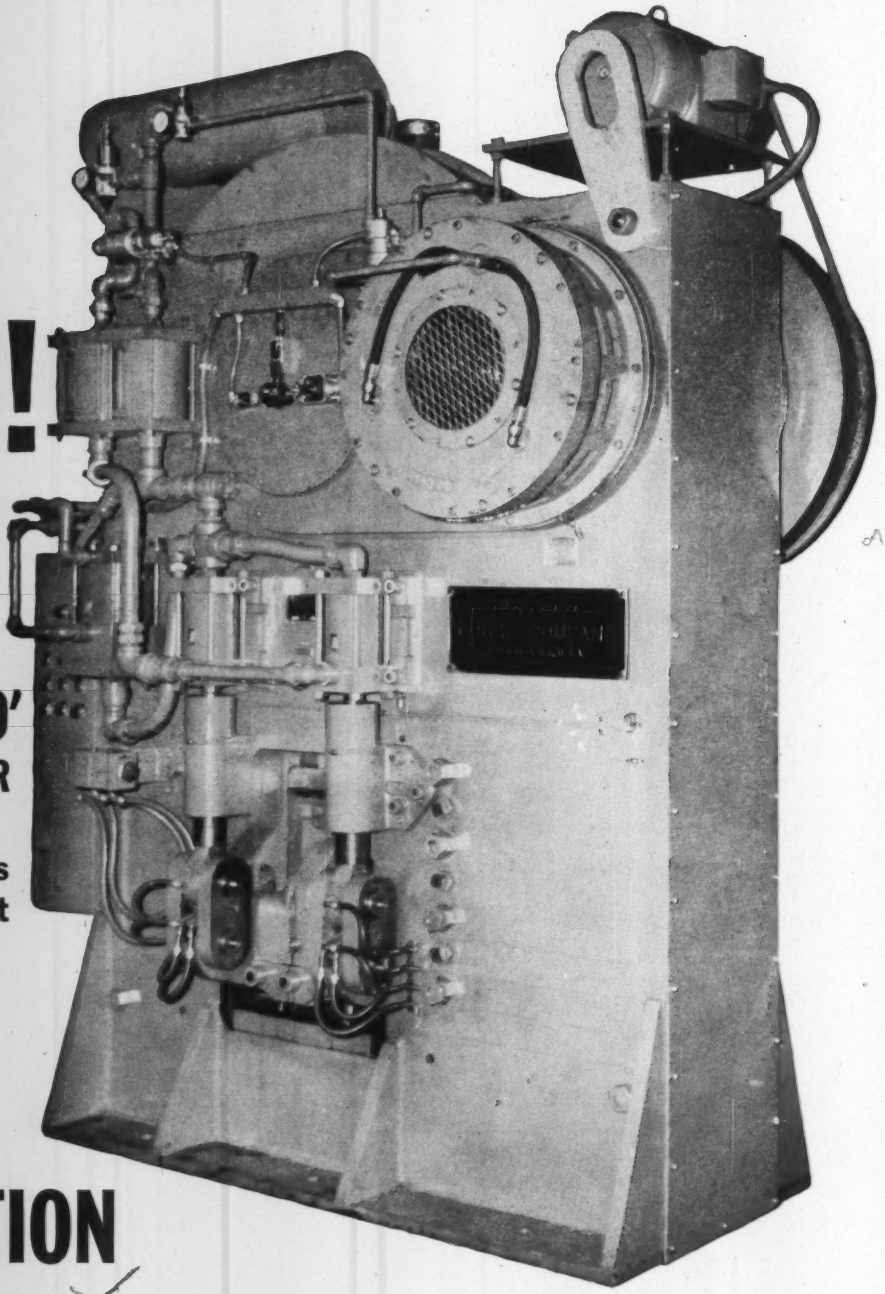
Peter A. Frasse & Co., Inc.

NEW YORK 13, N.Y.	PHILADELPHIA 29, PA.	BUFFALO 5, N.Y.	SYRACUSE 1, N.Y.	HARTFORD, 1 CONN.
17 Grand St.	3911 Wissahickon Ave.	P.O. Box 102	P.O. Box 1267	P.O. Box 1949
WAlker 5-2200	BAldwin 9-9900	BEdford 4700	HOward 3-8655	JAckson 9-6861

MORGAN CONSTRUCTION COMPANY WORCESTER, MASS.

ROLLING MILLS • MORGOIL BEARINGS • WIRE MACHINERY • REGENERATIVE FURNACE CONTROL • EJECTORS • GAS PRODUCERS

FAST!



'BUFFALO' 400 BILLET SHEAR

Up to 18,000 Cuts per 8 Hour Shift

THAT'S PRODUCTION

Discover how the *New* 'Buffalo' 400 Billet Shear can save time and boost production on your billet cutting operations. Contact your machine tool dealer, or write direct.

SPECIFICATIONS

Ram Tonnage	400 tons
Strokes per minute (free running)	60
Round Billets, Mild Steel	4½" dia.
Square Billets, Mild Steel	4" sq.
Flat Bars	12" x 2"
Knife Size	3" x 7½" x 13"
Motor Horsepower	20 HP Normal
Maximum Round or Square Size Without Modification	5" Sq. or Round
Machine Stroke	2"
Machine, Net Weight	32,000#
Length x Width x Height	80½" x 52" x 116½"

ESTABLISHED 1877 Buffalo MEMBER N.M.T.B.A.

MACHINE TOOL DIVISION

BUFFALO FORGE COMPANY

Buffalo, New York

'Buffalo' Air Handling Equipment to move, heat, cool, dehumidify and clean air and other gases.

'Buffalo' Machine Tools to drill, punch, shear, bend, slit, notch and cope for production or plant maintenance.

'Buffalo' Centrifugal Pumps to handle most liquids and slurries under a variety of conditions.

Squier Machinery to process sugar cane, coffee and rice. Special processing machinery for chemicals.

STEELMAKING AT JESSOP

Experience counts . . . and Jessop has it

There is no substitute for experience in making steel for the reactors of nuclear submarines like the Nautilus, the Skate and the Polaris-firing George Washington. Jessop's activity in nucleonics dates back to the early days of the Manhattan Project.

Today, Jessop's still at it—continuing research, improving techniques, piling up experience in making sophisticated steels to harness the atom. And Jessop is out front in other steelmaking fields too.

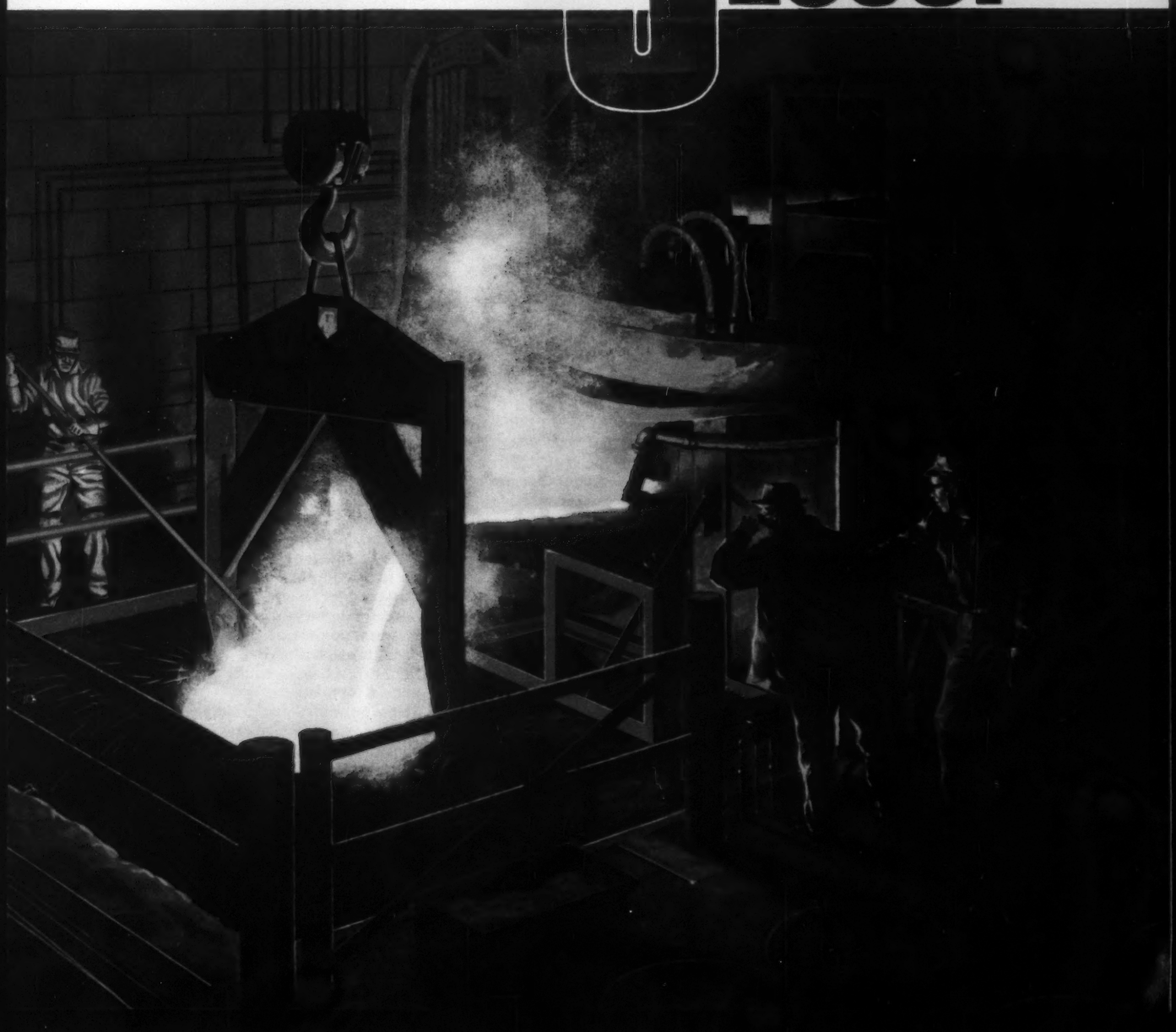
Whether you use heat- or corrosion-resistant stainless steels; abrasion- or shock-resistant steels; nonmagnetic or precision ground steels; high speed, cast-to-shape, clad or alloy steels, you can be sure of the quality—and *service*—you'll get when you do business with Jessop.

In quality steelmaking experience counts, and Jessop has it. Call a Jessop sales office in any of 23 major cities of North America and discuss *your* needs for specialty and alloy steels.

Jessop Steel Company
Washington, Pennsylvania

Plants and Service Centers:
Washington, Pa. • Los Angeles • Chicago • Detroit • Owensboro, Ky. • Wallaceburg, Ont.

JESSOP



LITTLE LATHE **Large Savings**

Lodge & Shipley Hi-Turn 45° COPYMATIC Lathe

"$10,000 Saved Is $10,000 Earned!"

A too-big, too-expensive lathe doesn't mean you'll do the job quicker, better or at lower cost. The Lodge & Shipley 1307 (10") HI-TURN 45° COPYMATIC Tracer Lathe is priced lower, by as much as $10,000, than conventional lathes of equal or less capacity . . . and that's just the start of savings!

Building the HI-TURN exactly to production requirements, Lodge & Shipley eliminates the leadscrew and all its complicated gearing. The result is a rugged lathe at exceptionally low cost with high accuracy and productive capacity.

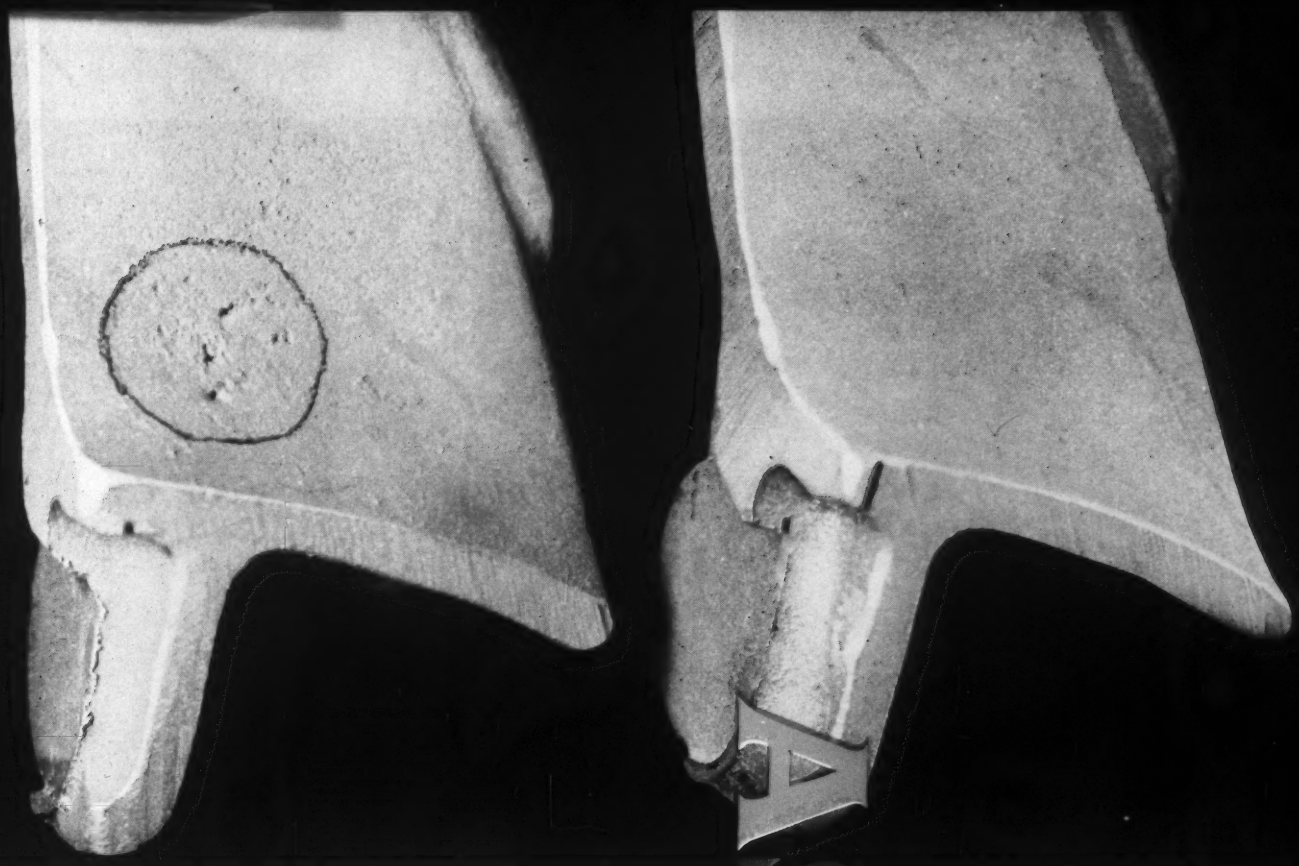
If you perform manufacturing or tracer lathe operations, it will pay you to investigate the many features of the low-cost HI-TURN Lathe.

- 5 HP at all speeds—9 geared speeds up to 3000 RPM
- Designed for heavy feeds
- Special spindle bearings require no warm-up period
- Famous elliptical girth bed
- Super rigid base—requires no special foundation
- Flame hardened and ground replaceable steel bedways
- Hardened and ground cross slide ways
- Allows machining, with a continuous cut, of almost any combination of normal lathe operations

This "little lathe" has proved itself as a "big producer"—gives you productive capacity matched to the job. Available in Production or 45° Tracer models. Write for information: Dept. HL-106, The Lodge & Shipley Co., 3073 Colerain Ave., Cincinnati 25, Ohio.

Your LODGE-ical Choice for Profitable Production

Lodge & Shipley



Now ASARCO process reduces and controls shrinkage

FEDERATED PT (pressure-tight) ALUMINUM CASTING ALLOYS

Use PT-processed metal instead of any of the standard sand and permanent mold aluminum casting alloys. Result: no unpredictable shrinkage. No need for extra gates and risers. Higher yield per pound of metal. More uniform pressure-tight castings. A brighter cleaner surface. All the same physical and mechanical properties and characteristics. Write or call today for full information about PT grade aluminum, to Federated Metals Division, American Smelting and Refining Company, 120 Broadway, New York 5, RE 2-9500; or call your nearest Federated sales office.

ASARCO

AMERICAN SMELTING AND REFINING COMPANY

Comparative photograph illustrates the effect of PT treatment. Casting on left from standard aluminum alloy, shows typical shrinkage over a large area. Compare with casting on right, cast in PT grade, under the same conditions! Alloy: F460 (319)

FEDERATED METALS DIVISION

Where to call for information:

ALTON, ILLINOIS
Alton: Howard 5-2511
St. Louis: Jackson 4-4040

BALTIMORE, MARYLAND
Orleans 5-2400

BIRMINGHAM, ALA.
Fairfax 2-1802

BOSTON 16, MASS.
Liberty 2-0797

CHICAGO, ILL. (WHITING)
Chicago: Essex 5-5000
Whiting: Whiting 826

CINCINNATI, OHIO
Cherry 1-1678

CLEVELAND, OHIO
Prospect 1-2175

DALLAS, TEXAS
Adams 5-5034

DETROIT 2, MICHIGAN
Trinity 1-5040

EL PASO, TEXAS
(Asarco Mercantile Co.)
3-1852

HOUSTON 29, TEXAS
Orchard 4-7611

LOS ANGELES 23, CALIF
Angelus 8-4291

MILWAUKEE 10, WIS.
Hilltop 5-7430

MINNEAPOLIS, MINN.
Tuxedo 1-4109

NEWARK, NEW JERSEY
Newark: Mitchell 3-0500
New York: Digby 4-9460

PHILADELPHIA 3, PENNA
Locust 7-5129

PITTSBURGH 24, PENNA.
Museum 2-2410

PORTLAND 9, OREGON
Capitol 7-1404

ROCHESTER 4, NEW YORK
Locust 5250

ST. LOUIS, MISSOURI
Jackson 4-4040

SALT LAKE CITY 1, UTAH
Empire 4-3601

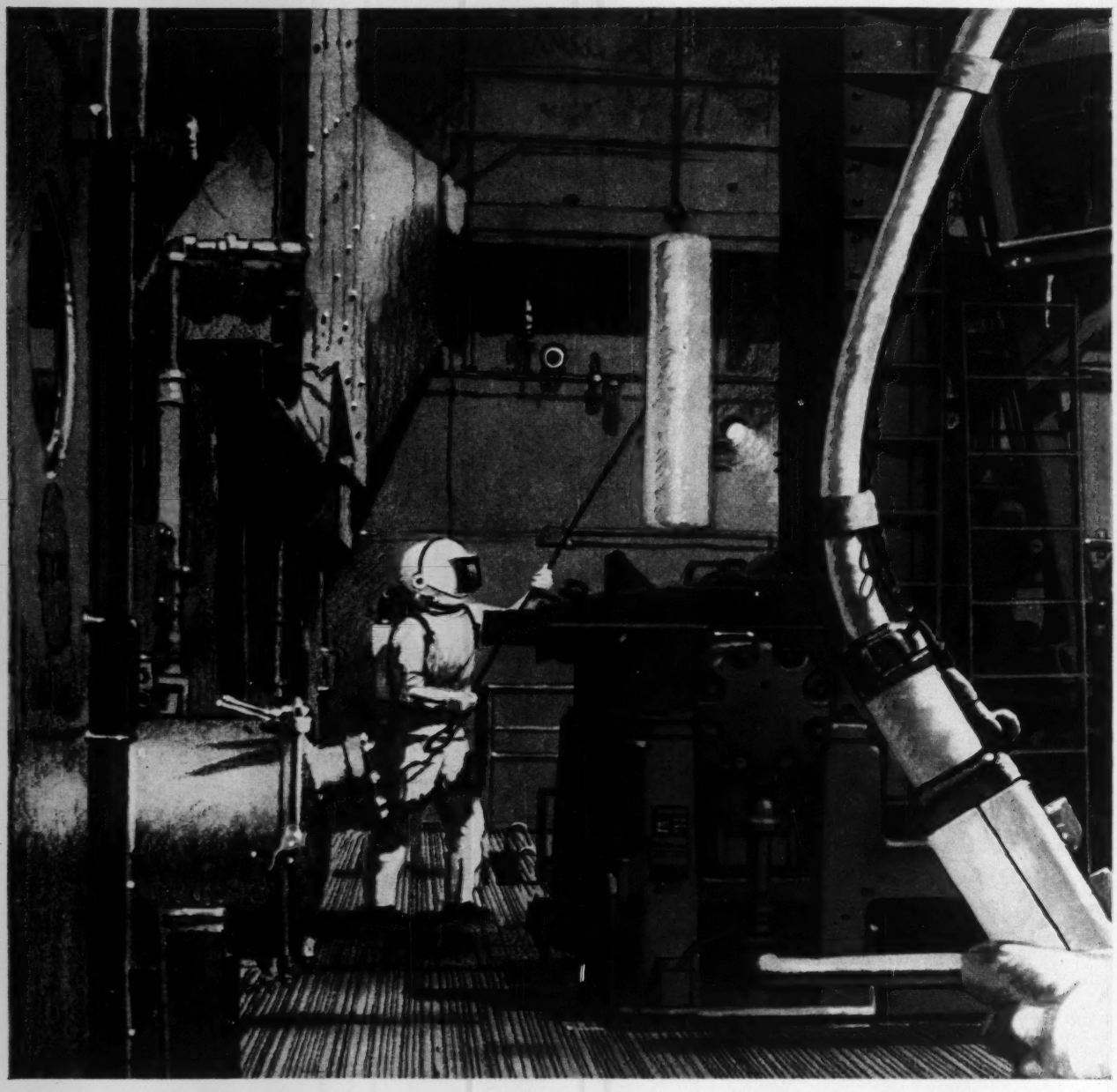
SAN FRANCISCO 24, CALIF
Atwater 2-3340

SEATTLE 4, WASHINGTON
Main 3-7160

WHITING, IND. (CHICAGO
Whiting: Whiting 826
Chicago: Essex 5-5000

IN CANADA: Federated Metals Canada, Ltd.
Toronto, Ont., 1110 Birchmount Rd., Scarborough, Phone: Plymouth 73246

Montreal, P.Q., 1400 Norman St., Lachine, Phone: Melrose 7-3591



The exotic world of space

Imagine a plant without air . . . where workers must operate in space suits . . . surrounded by an atmosphere of pure argon gas. These are the conditions at Universal-Cyclops Steel Corporation's In Fab project at Bridgeville, Pennsylvania.

This unique plant was developed because exotic space age metals such as tantalum, molybdenum, columbium, should be forged and hot processed in an oxygen-free atmosphere . . . *a world of their own.* Otherwise they may react violently or break down. Yet, because these refractory metals can retain strength far above temperatures that would destroy most materials, they are vitally needed for nose cones, re-entry vehicles, jet and rocket engines.

As a result, Universal-Cyclops—in conjunction with the Department of the Navy—built a hermetically sealed plant where rolling mill, impactor, induction furnace and

age metals...*where Mobil is right at home!*

all equipment are surrounded by inert argon gas. Even a tiny flaw in these metal products might cost a man's life in space. Here the standard of quality is perfection.

That's why you'll find the equipment here protected by *Mobil*. Mobil lubricants and Mobil men have always been right at home at the frontier of progress. America's leading industries rely on the leader in lubrication. Why accept less for your plant?

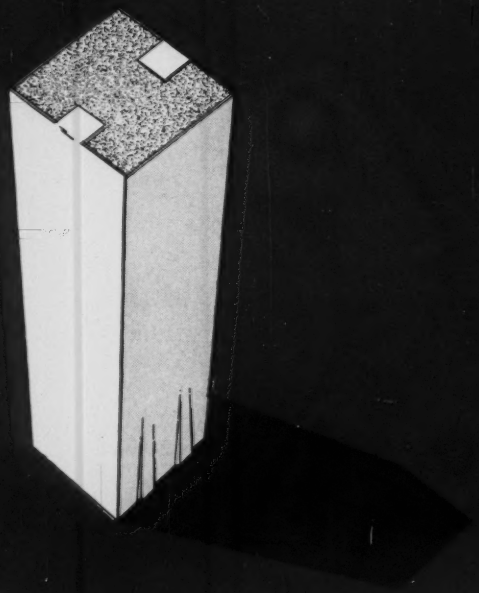
Mobil

Correct Lubrication

MOBIL OIL COMPANY, 150 East 42nd Street, New York 17, N.Y.

THIS IS LAVINO'S FERROBOND® CMX 3x3″ ROOF KEY

A NEW BASIC OPEN-HEARTH ROOF BRICK WITHOUT INTERNAL PLATES, DESIGNED BY LAVINO FOR MAXIMUM SERVICE AND ECONOMY



Every split-roof service test, comparing Lavino Ferrobond CMX 3x3″ Roof Keys with internally-plated brick, has shown it to be equal or superior in service life. *In addition, an approximate 8% savings will be realized in material costs whenever a 12″ or thicker roof is installed with Ferrobond CMX 3x3″ Roof Keys.**

*PATENT PENDING

HERE IS THE PERFORMANCE RECORD OF LAVINO FERROBOND CMX 3x3" ROOF KEYS IN SPLIT ROOF TESTS . . . THE MOST ACCURATE AND IMPARTIAL METHOD OF COMPARING BRANDS UNDER IDENTICAL OPERATING CONDITIONS.

The graphs below represent plan views of five open hearth furnace roofs. The blue halves were constructed with Ferrobond CMX 3x3" roof keys, the yellow halves with internally plated 4½x3" basic roof keys. Grey tones indicate where patching was required and the areas in white outline show where the hole developed, terminating the campaign.

SPLIT ROOF TEST "A"
190 ton furnace, 284 heat campaign
construction: 12" ribs 9" valleys
percentage of area patched:

FERROBOND CMX 3x3" ROOF KEYS	1.0%
INTERNALLY PLATED ROOF KEYS	1.6%

SPLIT ROOF TEST "B"
290 ton furnace, 453 heat campaign
construction: 15" ribs, 12" valleys
percentage of area patched:

FERROBOND CMX 3x3" ROOF KEYS	10.4%
INTERNALLY PLATED ROOF KEYS	19.0%

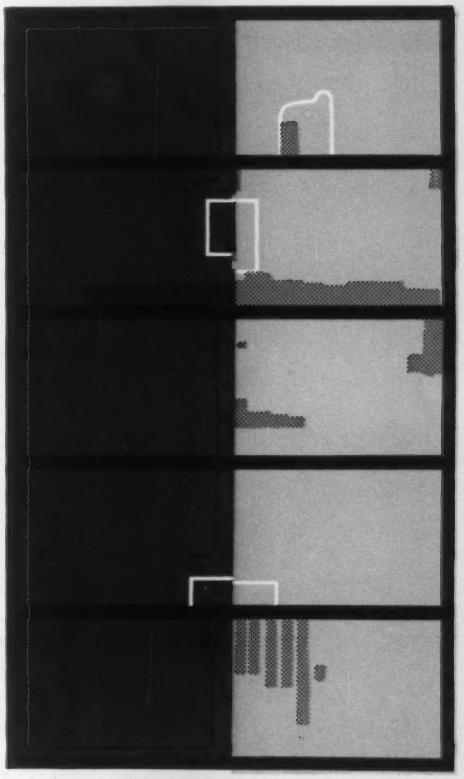
SPLIT ROOF TEST "C"
200 ton furnace, 488 heat campaign
construction: 15" ribs 12" valleys
percentage of area patched:

FERROBOND CMX 3x3" ROOF KEYS	2.8%
INTERNALLY PLATED ROOF KEYS	6.6%

SPLIT ROOF TEST "D"
400 ton furnace, 298 heat campaign
construction: 15" ribs 12" valleys
NO PATCHING

SPLIT ROOF TEST "E"
190 ton furnace, 250 heat campaign
construction: 12" ribs 9" valleys
percentage of area patched:

FERROBOND CMX 3x3" ROOF KEYS	2.2%
INTERNALLY PLATED ROOF KEYS	12.6%



In every split roof installation of Ferrobond CMX 3x3" roof keys, they have been compared with internally plated brands of other manufacturers . . . in each case they have proven equal or superior to these brands from a service standpoint . . . coupled with their economy and ease of installation, Ferrobond CMX 3x3" roof keys emerge as today's outstanding value in basic roof brick.

E. J. LAVINO
and company

REFRACTORIES DIVISION SALES OFFICES:

PHILADELPHIA • PITTSBURGH • CHICAGO

Your company is being contacted by Lavino representatives with details of our basic roof proposals.

FROM CREATIVE CRUCIBLE: HIGH SPEED STEELS THAT MAKE BETTER TOOLS POSSIBLE

TO MAKE SURE A TWIST DRILL'S CUTTING EDGES ARE SHARP AND CLEAN, an inspector measures its chisel angle, point angle and lip relief under the powerful lens of a precision instrument. Continually-improved Rex High Speed Steels help produce the fine edges so essential in twist drills.

MORE HOLES PER DRILL *Today's twist drills meet new standards for hardness, toughness and strength– because of continually improved Rex® High Speed Steels.*

Drills, the most heavily loaded cutting tools in metalworking, are now meeting even more exacting requirements. A matter of economics accounts for the new standards: because, *the profitability of the automated equipment in which the drills are being used depends solely on their performance.*

Twist drills that meet customers' strictest specifications–for hardness and toughness, for strength and precision–are being produced right now. They're available because of the drillmakers' continuing research and skill – combined with Crucible progress in making better high speed steels.

TWIST DRILLS made of Rex High Speed Steels consistently meet the drillmakers' exacting tests for hardness.

To produce the fine steels needed for twist drills, Crucible tool steel specialists now use the most advanced electronic instrumentation available. For example: they can record the temperature of the molten metal in the melting furnaces within 5 seconds. So, each heat is produced under identical temperature conditions.

Crucible specialists employ new techniques that also greatly improve deoxidation of the liquid steel. They use new ingot mold designs to minimize segregation. And they ultrasonically inspect every billet of Rex High Speed Steel before rolling or forging to ensure freedom from internal voids, flake, inclusions, etc.

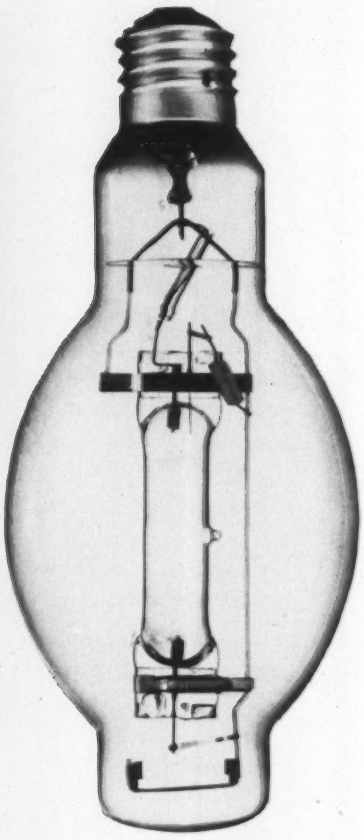
For complete information on how Rex High Speed Steels can help make precision tools better, call or write the Crucible branch office or service center near you.

BETTER TOOLS, THROUGH BETTER STEELS. Constant improvement of Rex High Speed Steels ensures the increasingly better performance of hobs, taps, broaches and cutters — as well as twist drills.

CRUCIBLE STEEL COMPANY OF AMERICA

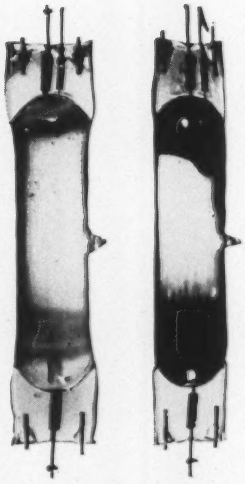
Branch Offices and Warehouses: Atlanta • Baltimore • Boston • Buffalo • Caldwell, New Jersey • Charlotte Chicago • Cincinnati • Cleveland • Columbus • Dallas • Dayton • Denver • Detroit • Erie, Pennsylvania • Grand Rapids • Houston • Indianapolis Los Angeles • Miami • Milwaukee • Minneapolis • New Haven • New York • Philadelphia • Pittsburgh • Portland, Oregon • Providence Rockford • Salt Lake City • San Francisco • Seattle • Springfield, Massachusetts • St. Louis • East Syracuse • Tampa • Toledo • Tulsa

6000 USEFUL HOURS EXTRA



New G-E "Bonus Line" Mercury Lamps. 6000 extra hours! That's the bonus your customers get in every 400-watt G-E "Bonus Line" Mercury Lamp . . . and a minimum of 3,000 hours extra in the other wattages. One look at these two light-producing arc tubes and you can see why General Electric "Bonus Line" Mercury Lamps are their best bargain. See how the one from a G-E Lamp stays white? That's because its special electrode doesn't deposit a *black* coating, but a translucent *white* coating that lets the light come through. The result: your customers get as much light at *9,000* hours as ordinary mercury lamps give at *3,000* hours. General Electric "Bonus Line" lamps now available in *all* sizes from 100 to 1,000-watts . . . in all popular shapes and "colors" . . . *at new low prices.*

Men in the know . . . know they get important differences when they specify General Electric Lamps—whether they're mercury, filament or fluorescent. So let your General Electric Lamp distributor explain the important plus you can get in the lamp types you use. General Electric Company, Large Lamp Department, C-033, Nela Park, Cleveland 12, Ohio.



BONUS ARC TUBE AFTER 8000 HRS.

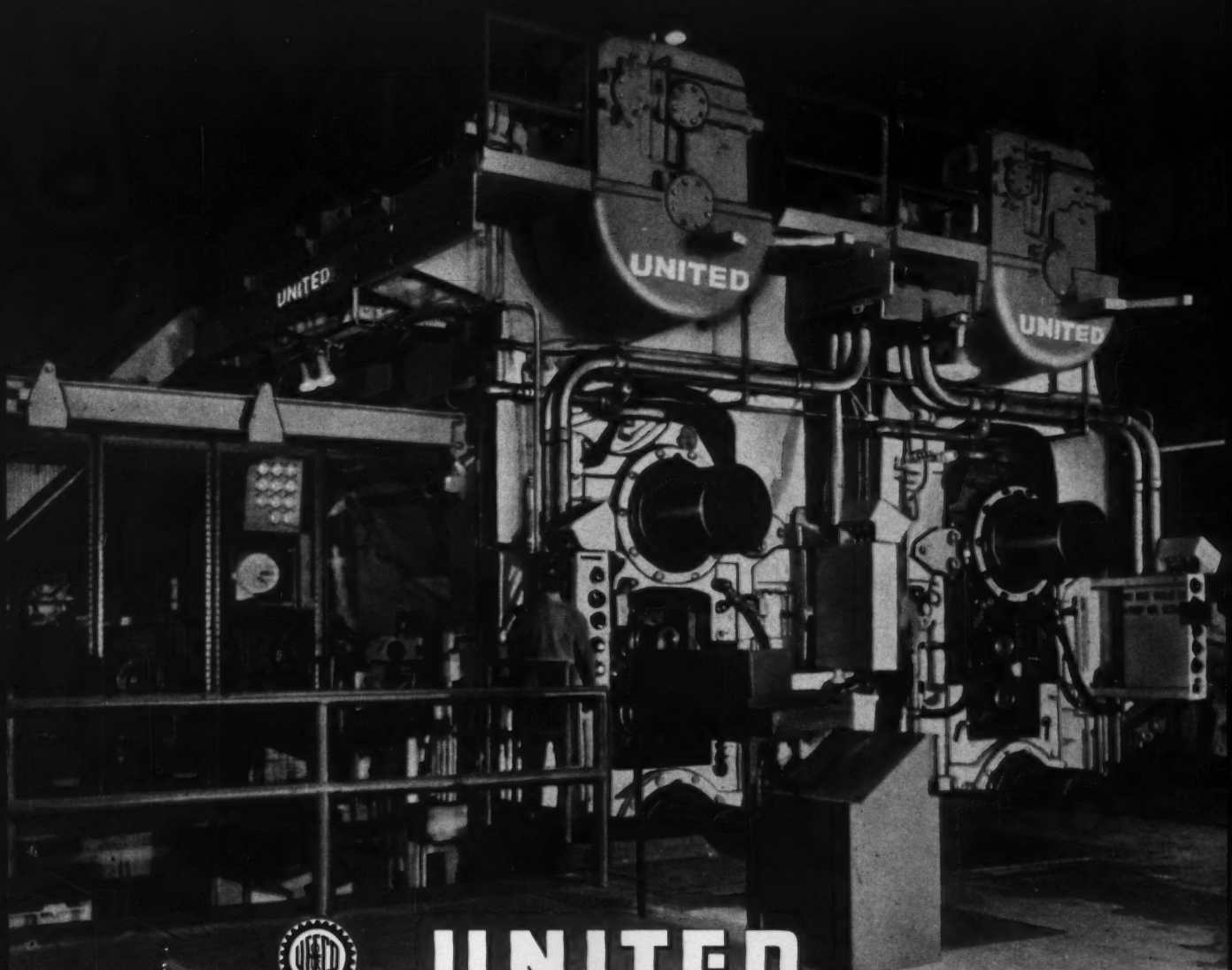
ORDINARY ARC TUBE AFTER 8000 HRS.

Progress Is Our Most Important Product

GENERAL ELECTRIC

UNITED®

4-HIGH 2-STAND TANDEM TEMPER PASS MILL



UNITED

ENGINEERING AND FOUNDRY COMPANY

PITTSBURGH, PENNSYLVANIA

Plants at Pittsburgh, Vandergrift, Youngstown, Canton, Wilmington

SUBSIDIARIES: Adamson United Company, Akron, Ohio
Stedman Foundry and Machine Co., Inc., Aurora, Indiana

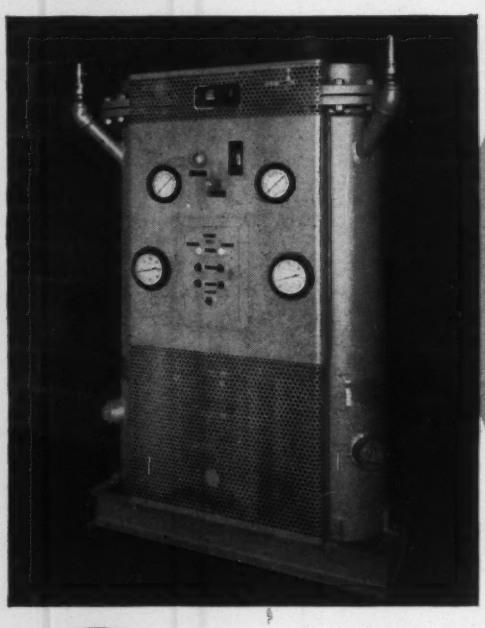
Designer and Builders of Ferrous and Nonferrous Rolling Mills, Mill Rolls, Auxiliary Mill and Processing Equipment, Presses and other heavy machinery. Manufacturers of Iron, Nodular Iron and Steel Castings and Weldments.

For precise atmosphere control in metalworking . . .

KEMP ORIAD DESICCANT DRYERS

give you 3 big advantages!

- In drying compressed air for air tools
- Drying hydrogen, helium, nitrogen
- Purifying furnace gases
- Drying instrument air
- Metal treating and brazing
- Drying air for paint sprays
- Testing equipment



1 Complete reactivation

Unequalled extra-drying power is assured with the unique 3-zone embedded heater in every Kemp Oriad Desiccant Dryer. Reactivation is always complete and uniform in drying air, gases or liquids.

2 Complete temperature control

Thermostatic control conserves heat input . . . keeps ideal temperatures for the highest operating efficiency at the lowest operating costs. The entire network is protected by an alarm circuit.

3 Complete automatic operation

Once the program timer is set, everything is regulated automatically. Drying takes place with the least loss in pressure, the lowest cost in maintenance and operation. For further information, write for Bulletin D-103 . . . or call the man from Kemp listed in the Chemical Engineering Catalog.

It always pays to come to **KEMP** OF BALTIMORE

THE C. M. KEMP MANUFACTURING COMPANY
405 E. Oliver Street • Baltimore 2, Maryland

ROEBLING WIRE, in Convenient Bulk, packaged to save you money, time and labor

If you use high-carbon wire in sizes from .060″ diam. to .030″ diam., it will pay you to investigate Roebling's Reel-less Core Packaging System. This method offers you substantial savings in several ways—to say nothing of the quality wire that Roebling always delivers in any kind of package.

Here's how simple it is:
Cores are palletized two cores per pallet and can be stacked two or three pallets high (think of the saving in storage space).

Empty reels are not accumulated because there are no reels to store, send back, bookkeep, get credit on, or pay shipping charges on (either way). Just unwrap the wire, set it up the way you see here, and there you are. Where a limited number of reel-less core packages are used, or where wire is flipped from reels mounted in a horizontal position, the tilt table is not necessary.

This method is typical, indeed, of Roebling's efforts to make quality easier to handle and to banish the problems that cost you time, money and sharp pains across the brow.

Full details of wire without reels will be immediately forthcoming when you write Roebling's, Wire and Cold Rolled Steel Products Division, Trenton 2, New Jersey.

ROEBLING

Branch Offices in Principal Cities
John A. Roebling's Sons Division • The Colorado Fuel and Iron Corporation

do your plans include mechanized drop forging?

The CECOMATIC Forging Process, based on the revolutionary Chambersburg Impacter, makes possible the continuous and automatic production of precision drop forgings. If you are a manufacturer whose products include drop forged components, you must consider mechanized forging in your plans for the future . . . . . your competition will do so—sooner or later. Practical information, with examples of successful mechanized forging operations, are included in the brochure, "The Automatic Production of Forgings in Closed Dies". Write for a copy today, to Chambersburg Engineering Company, Chambersburg, Pennsylvania.

CHAMBERSBURG

DESIGNERS AND MANUFACTURERS OF THE IMPACTER

WRIGHT SAFEWAYS
Now Available in
ALUMINUM or STEEL

• Take the finest hand hoist ever made for simplicity of design and sturdiness of construction...add to it new external and internal parts of aluminum...and you have the WRIGHT Aluminum Safeway Hand Hoist. This hoist is made lighter and more easily portable, yet retains all the advantages of the original Safeway design. It features load-bearing parts of strong, shock-resistant steel. Aluminum replaces the heavy steel covers, chain guide and hand chain.

It is a self-lubricating hoist which keeps load chain, load wheel and gear train operating smoothly at all times. Gear train is enclosed in grease-tight chamber and stays lubricated for life. Load chain and load wheel are lubricated by wick-type oiler fed from refillable reservoir.

Two factory tests certify the accuracy, workmanship and rated load-carrying capacities of these new aluminum hoists. Every foot of load chain is proof-tested and every completed hoist is tested at 50% above rated capacity.

Available now in six models in a capacity range of ½ to 4 tons, WRIGHT Aluminum Safeway Hand Hoists offer these outstanding features:

GEAR TRAIN • Planetary system using modified involute stub tooth gear form with all gear teeth generated from solid steel blanks.

LOAD BRAKE • Weston type with uniform composition lining and silent pawl.

LOAD WHEEL • Ferrous alloy, reversible, with accurately formed pockets.

LOAD CHAIN • Electrically welded, has maximum wear resistance and ability to withstand extreme impact.

LOAD CHAIN GUIDE • Guides chain into load wheel and shrouds load sheave, protecting parts from falling dust.

BOTTOM HOOK • Nickel-chrome-molybdenum alloy steel. Rocks and swivels. Operates on a Timken thrust bearing.

Contact Your WRIGHT DISTRIBUTOR

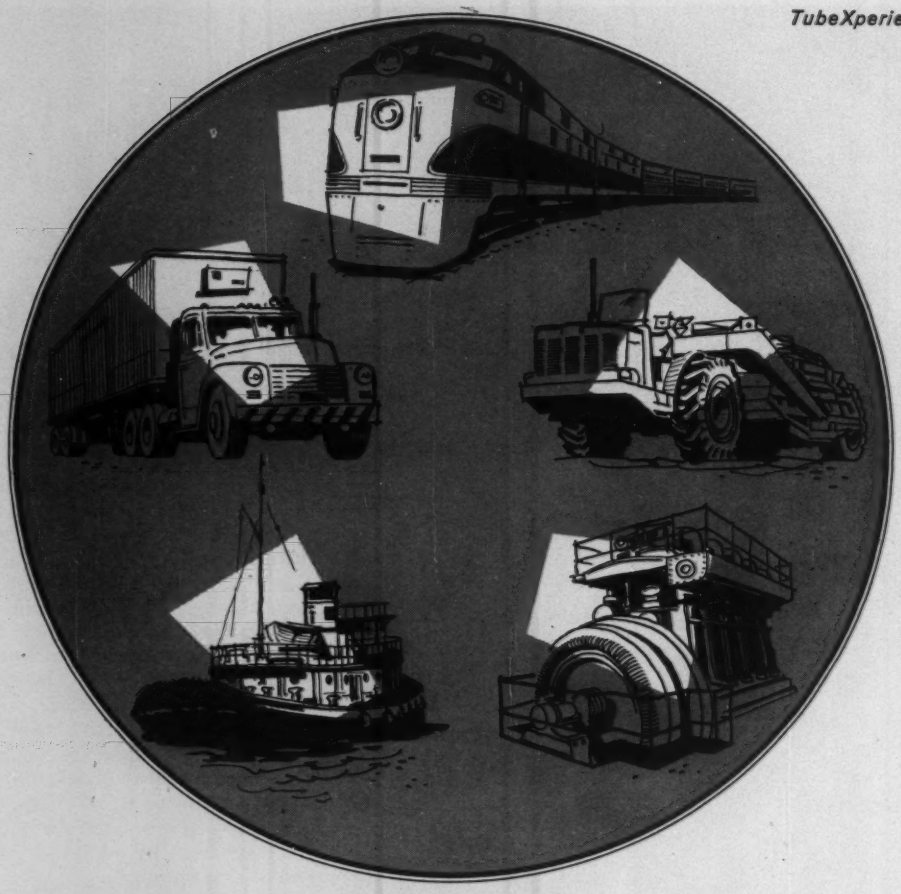
Or write our York, Pa., office for DH-164 and DH-345 which give complete information about WRIGHT Safeway Hand Hoists made from aluminum and steel. Find out the advantages they offer you.

WRIGHT HOISTS

ACCO

Wright Hoist Division • American Chain & Cable Company, Inc.

York, Pa., Atlanta, Chicago, Denver, Detroit, Houston, Los Angeles, New York, Philadelphia, Pittsburgh, San Francisco, Bridgeport, Conn.



Feedlines for hungry horsepower . . . diesel fuel injection tubing by Superior

Fuel injection systems are the heart of thousands of diesel-powered trucks, locomotives, roadbuilding equipment, electric generators, and marine power plants. The tubing that conveys the fuel from injection pump to nozzle assembly is an important component. It must resist the stresses of pressure and vibration, yet be ductile enough to be cold swaged and upset and be cold formed into loops and bends without excessive springback. It must have a clean ID, tremendous burst strength, and high fatigue resistance. Superior diesel fuel injection tubing is just such a premium product.

Type C-1008 and Type MT-1010 carbon steel tubing are most commonly specified for this application, but alloy and stainless steel tubing for pressures above 9000 psi and greater corrosion resistance is available. Superior also makes tubing for many other applications—supplies both general and special purpose tubing for aircraft, missiles, electrical, electronic, chemical, hydraulic, dairy and nuclear, to name a few. For complete information, write Superior Tube Company, 2004 Germantown Ave., Norristown, Pa.

SOME REASONS WHY SUPERIOR FUEL INJECTION TUBING IS A PREMIUM PRODUCT

- It will handle pressures to 9000 psi, is hydrostatically tested to various pressures according to specification
- It is cold drawn, dead soft annealed, and seamless
- It is ID conditioned to remove fissures and other defects
- It is free from ID radial cracks deeper than .005 in. or 5% of wall thickness, whichever is less
- It is annealed at finish in controlled atmosphere furnaces to produce a soft, ductile and scalefree material
- Fracture tests are performed when requested

Superior Tube

The big name in small tubing

NORRISTOWN, PA.

All analyses .010 in. to ⅜ in. OD—certain analyses in light walls up to 2½ in. OD

West Coast: Pacific Tube Company, Los Angeles, California • FIRST STEEL TUBE MILL IN THE WEST

EYES ARE EXPENSIVE TARGETS!

See How Western Electric Cut Eye Accident Rate 36% With Low-Cost AO Eye Protection Program

THE INSTALLATION ORGANIZATION of Western Electric Company employed 15,585 field employees in 1955 and 22,391 in 1958. Operations include erecting steel frames, mounting telephone switching equipment on the frames, cabling, connecting wire ends and thoroughly testing the finished job before turning it over to a Bell Telephone Company. Chief eye hazards are being struck by tools if wire breaks, exposed and protruding wire ends, solder splashes, flash burns and drilling.

In 1955, before a complete eye protection program was installed, the frequency rate for eye accidents was 15.9. In 1958, with all field forces equipped with safety glasses, the frequency rate dropped to 10.2. Frequency rate is the number of accidents times one million divided by the number of working hours.

Yes, industrial eye protection pays off. It saves eyes, pain, grief, skills — and dollars in compensation and medical costs. (In larger companies, dollar savings in five figures annually are not uncommon.) And when you install a program be sure you get the safety you pay for — in *safety standard frames and lenses.* Look for the AO Trademark. Write for new booklet "Eyes Are Expensive Targets".

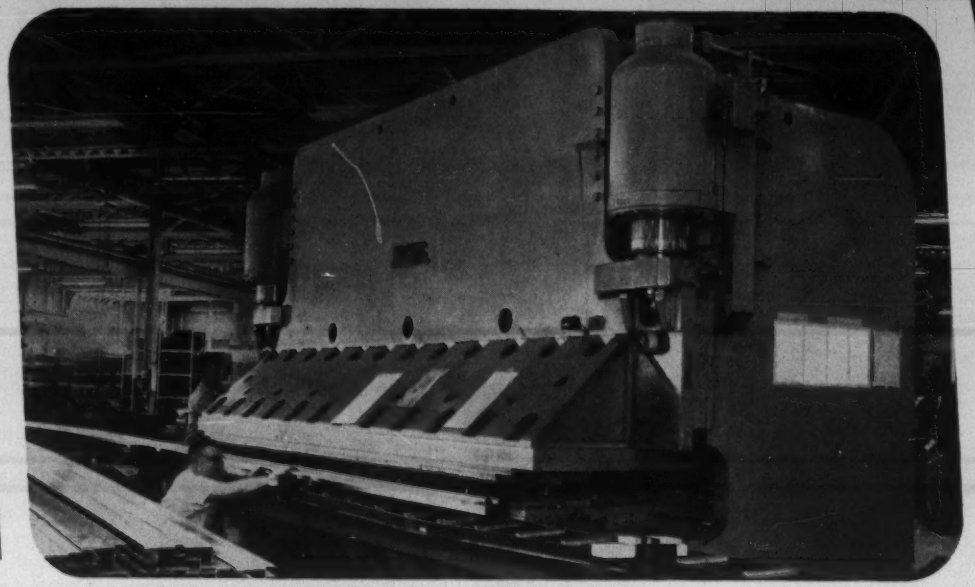
American Optical
COMPANY
SAFETY PRODUCTS DIVISION
SOUTHBRIDGE, MASSACHUSETTS
Safety Service Centers in Principal Cities

Always insist on AO Trademarked lenses and frames

15 years engineering and millions of dollars invested* to perfect the world's finest brake... today's PACIFIC HYDRAULIC PRESS BRAKE

Over 9 out of every 10 hydraulic press brakes in operation today are PACIFIC providing...

- More dependability
- Freedom of maintenance and leakage
- Simpler electric controls
- Simpler hydraulic control
- More accuracy in level control
- More accuracy in air bending
- More operating convenience
- Greater visibility
- More rigidity in cylinder construction
- Shock-free hydraulic system suitable for punching



*THIS INVESTMENT ENABLED PACIFIC TO INTRODUCE:

- Tape control to synchronize cylinders within .003" (1947)
- Cushioned punching (1949)
- Precision depth control to repeat accuracy within .001" (1951)
- Manual turret stroke controls for progressive bending (1952)
- Selective anti-whip speeds to eliminate reverse bends (1952)
- Tandem operation of press brakes for forming pieces 40 ft. or longer (1953)
- Tonnage control to protect light dies in heavy press (1953)
- Multiple hydraulic cushion cylinders for deep drawing (1954)
- Overhead integral power unit for increased accuracy (1955)
- Cylinder ram guides for increased rigidity (1956)
- Shearing attachment for shearing heavy plate on press brake (1958)
- Pipeless stacking of valves to eliminate pipe breakage and leakage (1959)
- Shockless hydraulic valving to eliminate cause of leakage (1959)

672 HOLES PUNCHED IN A SINGLE HIT! Unique upper ram guides and extra rigidity of platens of PACIFIC hydraulic press brake enable the punching of 672 holes in a single hit over a 45" wide by 14 ft. long side panel at Brown Trailer Division, Michigan City, Indiana. This rigidity permits 40 ft. long rub rails to be punched progressively with 70 holes on 2" centers over 12 ft. length on the front of the die as shown in the above photo. Cushioned hydraulic breakthrough softens the punching action on the dies to greatly increase individual punch life and eliminate costly downtime from periodic die replacement of 672 separate dies.

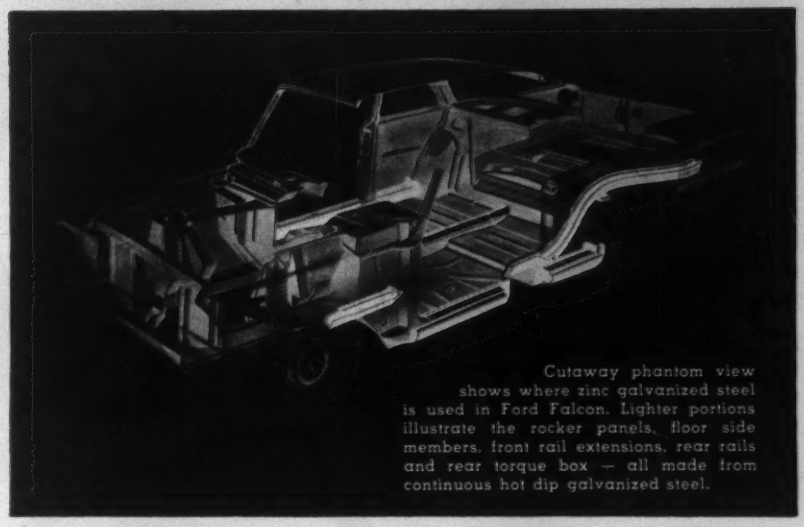
PACIFIC PRESSES AND SHEARS

PACIFIC INDUSTRIAL MFG. CO., OAKLAND, CALIF. • PACIFIC PRESS AND SHEAR CORP., MT. CARMEL, ILL.

DISTRIBUTORS: ALBUQUERQUE, N. M.; DENVER, COLO.—R. E. Duboc Associates • ARIZONA; LOS ANGELES AND BURLINGAME, CALIF.; NEVADA—Tornquist Machinery Company • ATLANTA GA.; ORLANDO, FLA.—J. R. Carlson Machinery Company • CHICAGO (North), Ill.—L. C. Evans & Company • CHICAGO (South), Ill.—BFM Machinery Co. • CLEVELAND, OHIO—Jackson Machinery DAVENPORT and DES MOINES, IOWA; KANSAS CITY and ST. LOUIS, MO.; OKLAHOMA—Maehlenpah Engr. Inc. • DETROIT, MICH.—Taylor Thompson Machinery Company • DALLAS, TEXAS—Machine Tool Associates • HAMILTON, OHIO—Anscheutz Machinery • HOUSTON, TEXAS—Butcher-Carter-Preston • INDIANAPOLIS, IND.; LOUISVILLE, KY.—H. B. Green Mch. Co. • NEW YORK CITY—Van Dyke-Churchill Co. • MILWAUKEE, WIS.; MINNEAPOLIS, MINN.—Gute Company • NORFOLK, VA.; KNOXSVILLE, TENN.—Tidewater Supply Co. • NEW ORLEANS, LA.—Dixie Mill Supply Co. PITTSBURGH, PA.—Howard Canning • PORTLAND, ORE.—Portland Machinery Company • ROCHESTER, N. Y.—Ogden R. Adams Co., Inc. • SALT LAKE CITY, UTAH—Todd Machinery Company • SEATTLE, WASH.—Portland Machinery Co. • EASTERN PENNSYLVANIA; WASHINGTON, D.C.; MARYLAND; DELAWARE; SOUTHERN NEW JERSEY—Edward A. Lynch Machinery Co. • WETHERSFIELD, CONN.—Beisel Machinery Company • TORONTO, ONT., CANADA—Hercules Presses Ltd. • WINNIPEG, MAN., CANADA—Taylor Machinery Company • HALIFAX, N. S.—Foullis Eng.

ZINC GALVANIZING

Protects Vital Body Parts In FORD MOTOR CO.'s Compact Cars



Cutaway phantom view shows where zinc galvanized steel is used in Ford Falcon. Lighter portions illustrate the rocker panels, floor side members, front rail extensions, rear rails and rear torque box — all made from continuous hot dip galvanized steel.

COMPARATIVE TESTS PROVE GALVANIZED STEEL BEST CORROSION GUARD FOR VULNERABLE PARTS IN UNITIZED CONSTRUCTION

After 2½ years of evaluation tests, FORD MOTOR COMPANY'S Advanced Body Development decided galvanized steel was the best material for protecting unitized bodies against corrosion.

The box type construction of unitized bodies makes corrosion a critical problem because moisture and road salts become trapped in vital underbody parts. Zinc galvanized steel is expected to give these parts 2½ to 3 times longer life than conventional low carbon steel. This would mean that they will be corrosion-free for 10 to 12 years under normal use.

This is the reason why Ford and other auto makers are now using galvanized steel for the basic framing members of the new unitized bodies.

ANOTHER EXAMPLE OF THE VERSATILITY OF CONTINUOUS GALVANIZED STEEL

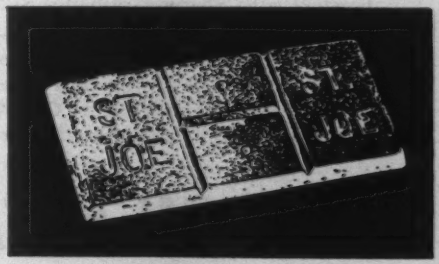
The use shown here is one of a wide variety of applications where continuous galvanized sheet provides the successful combination of protection plus formability. This pre-protected metal can withstand torturous deformation without losing its corrosion-resistance. The zinc coat flows with the base metal — does not chip, flake, powder or peel under severe forming operations.

St. Joseph Lead Co. supplies zinc "electronically-matched" to virtually any specifications which operators of continuous galvanizing lines may require.

ST. JOSEPH LEAD CO.

ST. JOE

250 Park Avenue, New York 17, N. Y.



ZN-169

SHERWIN-WILLIAMS
SUPERCLAD®
VINYL
STRIP
COATINGS

Metals pre-coated with SUPERCLAD or KEMCLAD may be stamped, punched, brake-formed, die-formed, roll-formed and assembled in many forms without damage to the finish. Ask for help on your products.

SHERWIN-WILLIAMS
KEMCLAD®
STRIP
COATINGS

These coatings for PRE-FINISHING your products have been exposure-proved for more than 14 years

CAN YOU AFFORD LESS?

Some of the many ways pre-coated metals can save you money may be unknown—*but the performance you can expect from the coatings need not be.*

Sherwin-Williams SUPERCLAD and KEMCLAD Enamels for the pre-finishing of continuous metal strip have been exposure-proved on exterior and interior applications for as long as 14 years. First in the field of finishes for aluminum house-siding, awnings, Venetian blinds and many other related products, Sherwin-Williams offers products backed by complete field performance records and experience.

More than 1,000,000 aluminum-siding homes in all sections of the country, pre-finished with Sherwin-Williams SUPERCLAD and KEMCLAD materials, are evidence of this background.

Specify Sherwin-Williams and be *sure,* on the coated metals you use or the coatings you buy. If you *don't* pre-coat or use pre-coated metals—better investigate! The Sherwin-Williams Co., General Industrial Division, Cleveland, Ohio. In Canada: 2875 Centre St., Montreal.

SHERWIN-WILLIAMS / INDUSTRIAL FINISHES

THE BUILDING BUSINESS IN THE 1960's will provide the largest market ever attained by any fabricating industry, according to the F. W. Dodge Corp. The forecast: A need for more than $900 billion worth of goods and services in the construction industry during the Sixties.

WIRE INVENTORIES held by users offer a bleak surprise to wire producers. After six months of continuous reduction of stocks, it is still possible to find wire buyers with stocks as much as 20 pct over normal - while many wire buyers are depending on two-week deliveries to keep their shops running.

SALES OF NEW CARS IN 1961 "as high as seven million" are predicted by E. N. Cole, general manager of Chevrolet Div. of GM. Truck sales in 1961 should total one million units, says Mr. Cole.

DURABLE GOODS PRICES have been declining almost continuously since last December, according to the Labor Dept's. consumer price index for July. In July, prices of durable goods were 1.8 pct lower than in July 1959. Prices of services and nondurables increased, as much as 2.9 pct.

SOME AUTO PARTS MAKERS are concerned over Detroit's swing to six-cylinder engines. Gaining impetus from the compacts, sixes went into 40 pct of '60 models, are expected to top 50 pct in '61.

SHIPMENTS OF GAS WATER HEATERS set a new high for the year in July, reports the Gas Appliance Manufacturers Assn. Shipments for the month totaled 260,200 units. This is 6.2 pct over shipments in July of last year.

THE INDEX OF THE AMERICAN GEAR MANUFACTURERS ASSN. shows a 19.4 pct decrease in July from June. The July index was 217.5 (1947-49=100) for new bookings. This is below the 1959 average of 234.7. The index of shipments also dropped in July to 210.8, down from 253.6 in June.

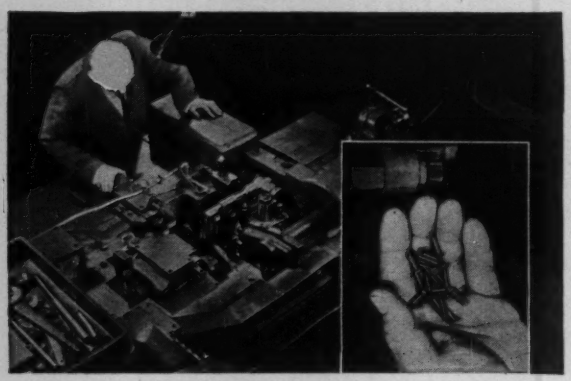
NEW ORDERS FOR INDUSTRIAL SUPPLIES AND MACHINERY in July dropped 3 pct in July from June, report members of American Supply and Machinery Manufacturers Assn. The new order index fell 6 points to 191 (July 1948=100). This is a continuance of the slight but steady drop from the 221 high reached March 1959.

Which picture do you fit?

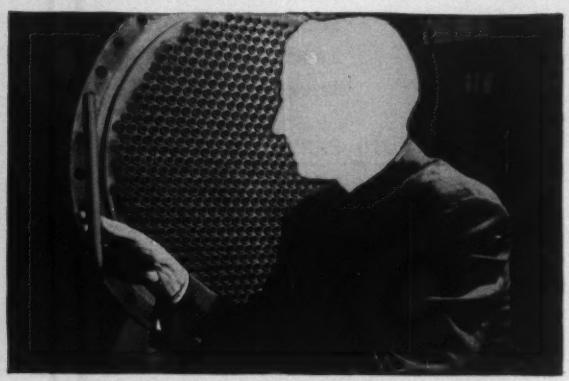
Here are four *actual* customers* with different, but exacting product and technical needs. One uses Bridgeport rod in a range of alloys, the second Bridgeport strip. A third makes fasteners from Bridgeport Brass wire. The fourth company uses Bridgeport condenser tubes *and* Technical Service to produce quality heat exchangers. Which picture do you fit with your raw materials and manufacturing requirements?

"AUTOMATIC QUALITY," says Customer A. "We've a high-volume, automatic screw machine operation. Our alloy needs vary from job to job. Our production schedules demand *consistent* quality alloy and accurate gauge. With every rod alloy we get from Bridgeport, we get what we order . . . including aluminum alloys!"

"LONG-LENGTH COILS. They're one reason why we can depend on Bridgeport for strip," says Customer B. "Superior surface finish from Bridgeport saves us production costs. With their Sendzimir mill finish and exact gauge and width in long-length coil, you can see the reasons why we depend on Bridgeport for brass, copper and aluminum strip."



"CONSISTENT GAUGE. We need Bridgeport quality brass wire to make thousands and thousands of fasteners of every description," says Customer C. "High-speed, volume cold-heading production is only as good as the alloy wire that's used. Bridgeport Brass wire is made to exact tolerances for cold-heading at high speeds—we depend on it."



"PRODUCT PLUS SERVICE," says Customer D. "We manufacture heat exchangers for many applications. Our requirements include good technical and engineering service as well as a wide choice of brass, copper and aluminum tube alloys. All of these are available from Bridgeport."

*Names on request

These examples typify national metalworking opinions. There's no mystery why manufacturers the country over depend on Bridgeport—Bridgeport products and service are *close at hand*. The many brass, copper and aluminum alloys made by Bridgeport in rod, tube, wire and strip are *readily* available from stocks in your area; Bridgeport warehouses are located to make it easy for you to get what you want on time. Volume needs are mill-delivered. Your call to your nearest Bridgeport Sales Office, or a letter to Dept. 3409 will get you engineering and technical service. Try it, and you'll agree —you do fit into the picture!

Bridgeport Brass Co.

BRIDGEPORT BRASS COMPANY

Bridgeport 2, Conn. • Sales Offices in Principal Cities

Specialists in Metals from Aluminum to Zirconium

Appliance Makers Buck Market

They Scramble for Sales as Housing Starts Fall

The percentage fall in sales of appliances is less than half the decline in new houses.

While replacement market buyers still show indifference, marketing efforts are starting to pay off.—By J. D. Baxter.

■ Makers of major appliances aren't standing still in the face of declining housing starts.

Total U. S. housing starts in the first half of this year plummeted to 654,600 units from 795,000 for the same period last year, a drop of 17.7 pct. Manufacturers sales of major appliances dropped only about half of that figure for the same period.

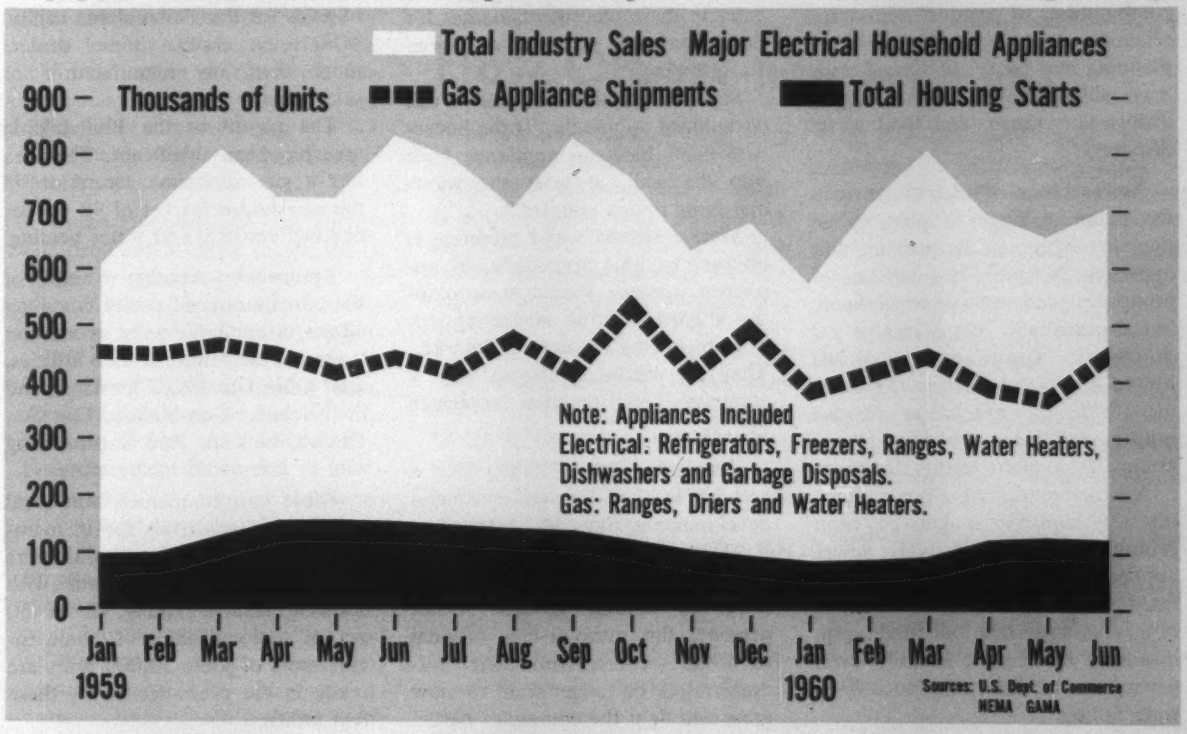
A drop in sales of major appliances is probably never proportionate to a drop in housing starts. But when the appliance sales drop is about half of the drop in housing, then some real marketing effort is indicated. This effort is going on while consumers are showing a general disinterest in durable goods in the replacement market.

Dual Effect — Another light on the situation is shed by John L. Utz, general manager, special market planning, Consumer Products Division, Philco Corp. Says Mr. Utz:

"The decline in housing starts has had a double-barrel effect on the appliance market that is often overlooked. First, fewer new houses mean fewer unit appliance sales in this market. Second, many builders, to keep a low-as-possible sales tag on their houses in a tight market, drop a number of appliances that would normally be included. It's much easier to own an appliance included in a 20-year mortgage than it is to buy one right after putting out all your money on a new house."

A big part of the "hold the line" move by major appliance makers

Appliances Move Up Despite New Housing Lag



"It's a two-pronged attack. We're going after the dipping new house market, and we're also working harder on replacement business."—J. L. Utz, Philco Corp.

hit by housing drops has been simply one of pricing. Prices of most lines have held steady, some have been cut.

Special Services — Some appliance makers have added special services to go along with their products. Gas appliance maker, Caloric Appliance Corp., reported its sales for the fiscal year ended June 30 were the highest in the company's 70-year history. LeRoy Klein, vice president of sales, credits this increase to the introduction of a kitchen color-planning service. This service gives builders and homemakers complete kitchen decorating advice when they buy Caloric gas appliances.

Other appliance makers, such as General Electric, have approached builders and homeowners with the packaged "unit" kitchen. Here, combinations of group-designed appliances are offered for ease of planning and purchase. These units may include clothes washer, dryer, dishwasher, range, and food waste disposers.

Newer Lines—Philco Corp. is in the planning stage to possibly go one step further in the package unit approach. Not only is a full line of group-designed appliances planned, but also available in a choice of gas or electric. Top company officials hosted a two-day meeting this summer with 81 executives of gas utilities and gas associations to announce their plans in this direction.

Another marketing approach taken by appliance makers has been promotion of the relatively newer appliance lines that have unsaturated markets. Sales of built-in ranges, dishwashers and food waste disposers have risen steadily even when sales of other appliance lines were falling.

Sales Trend—Unit sales for built-in gas ranges for the first six months of 1960 rose by 10.1 pct over sales for the same period in 1959. Sales of free standing ranges dropped by 6.8 pct during the same period.

In the first six months of 1959, 240,400 electric dishwashers were sold by U. S. appliance manufacturers. In the same period of 1960, 277,600 units were sold, a gain of 15.5 pct.

And another line bucking the tide of generally falling appliance sales is the electric food waste disposer. Unit sales of this item rose by almost 4 pct from the first half of 1959 to the first half of 1960.

Custom Look — Appliance makers have taken the cue from the sales pattern of built-in ranges, for example, to produce compact counter-level built-in appliances. Sales in the replacement market for these lines are reported as "large and growing."

Says one appliance maker of this customized approach: "If the housewife can't have an appliance built into the wall, at least she wants one built into a counter."

Market research and planning is pointing to other approaches by appliance makers. Philco is developing a harder-hitting marketing approach in the apartment market. They are backing this up with a compact under-counter appliance line.

Return to Cities—Philco sees a growing market in urban apartment developments. Says Mr. Utz:

"There is a definite shift underway towards a return from suburbia by certain groups. Older persons, the more-or-less original suburban settlers, with their children raised, no longer want to mow grass and fight the commuter battle.

"These people are looking back to the city. And builders are going after this market with economical and comfortable apartments. Practically every large U. S. city is seeing this development."

Utilities Aid—An important element in the major appliance marketing picture is the work of utility companies. This is particularly true in the gas appliance field where manufacturing companies do not usually have the size and resources of the big electrical appliance makers.

Some utilities back up dealers and builders through advertising only. Others actually merchandise broad lines of appliances as well as do advertising and promotion back up of dealers. And another group tends strictly to the utility field.

Frequent Contact — Utilities are becoming stronger allies of builders and dealers. At the heart of their programs is a dealer contact organization offering sales promotion ideas. The Philadelphia Gas Co. has 42 men calling on about 600 dealers in the area served by the utility.

Says Frank H. Trembly, director of sales for the Philadelphia utility: "Our men contact these dealers more than any manufacturer or salesman."

The payoff in the Philadelphia area has been significant. The area has a gas appliance saturation in the new house market of 98 pct for heating, cooking and water heating.

Teamwork—Another example of the effectiveness of utility company efforts in appliance sales promotion is seen in the Midwest. Two utilities, East Ohio Gas Co., Cleveland, and the Michigan Consolidated Gas Co., Detroit, took the lead in promoting sale of household incinerators.

These two companies won local government approvals for incinerators and got behind manufacturers and dealers in a program with startling results. Today, about 50 pct of national sales of home incinerators of some 50,000 units are made in the areas served by these two utilities.

GE Tries New Approach With IUE

Job Security Plan Unique in Industry

General Electric offers training pay for displaced workers and benefits for laid-off employees.

IUE's Carey offers immediate opposition, calls program "unresponsive."—By G. J. McManus.

■ A new approach to job security pay has been proposed by General Electric Co. in talks with the International Union of Electrical, Radio and Machine Workers. General Electric last week offered a program that includes these points:

1. A plan to provide laid-off workers with immediate benefits in the form of severance pay or training tuition, or weekly benefits after state compensation runs out.

2. A plan to train displaced workers while paying them 95 pct of their regular wages.

GE proposes a three-year contract with straight pay hikes of three pct for October of this year and four pct in April, 1962. The company packaged pension and other fringe improvements. It would drop the cost-of-living provision of the present contract.

Union Opposed—No part of the GE proposal is likely to win quick union approval. IUE terms the offer, "Totally unresponsive to the stated demands of the membership." Union president James B. Carey says GE took several backward steps when it proposed the elimination of the cost-of-living provisions.

However, job security shapes up as the most important issue of the current talks and the one with broadest significance. Reflecting a common labor concern, IUE has named employment protection and unemployment aid as prime bargaining goals. In the opposite corner, GE has been a strong holdout against jobless pay as a direct company obligation.

GE's Thinking—GE's position in this matter reflects the same combination of conservative and radical thinking that marks its whole labor relations policy. Unlike most big manufacturers, the electrical company has held to the notion that unemployment benefits are not a direct company concern. Equally unique, however, GE has worked vigorously to secure higher state compensation in its operating areas.

While the new proposal seems to retreat from these positions, it also seeks to preserve concepts cherished by the company. In the amount and manner of payment, the proposal stresses individual service and individual rights. Principles of group financing and group welfare are carefully avoided.

"It's really just an extension of our employee savings plan," says a GE spokesman.

What's Offered — The proposed contract would make a worker eligible for benefits based on one week's pay for each year of service. The employee would not contribute to the account credited to him.

In the supplementary unemployment benefit (SUB) plans of the steel and auto industries, the amount of a man's benefit does not depend directly on the length of service.

General Electric's plan calls for a distinct manner of payment. The employee may take his full benefit as a lump sum at the time of layoff. This amounts to severance pay and the employee loses recall rights. As another option, the man may draw weekly payments or a full lump sum when state payments expire.

How Others See GE Plan

Labor's reaction to the GE plan has not been enthusiastic.

The IUE says the plan amounts to nothing more than termination pay. The union says GE is offering nothing on subcontracting, scheduling, and other matters affecting job security.

An official of the United Steelworkers said the plan fell far short of steel's SUB program. He said the use of service as a basis for payments provided least help for new workers who are most likely to be let go.

The pooling of funds under the SUB plan made it possible to give help to areas and groups that were hardest hit.

A steel company official had reservations on the matter of financing. He felt there might be advantages in SUB arrangements because they limit company liability and provide flexible benefits. Under the GE plan, he said, benefits are fixed and company liability is unknown.

The training phase of the new proposal may point to a general trend. A program of training and relocation was mentioned at one stage in the steel labor negotiations. In the agreement that ended the meat-packer dispute, provision was made for funds to support a formal relocation effort.

GE's plan stresses training both for relocation within the company and for placing jobless workers in other companies.

Cuba: A Danger Signal for U. S. In Latin American Relations

The outlook in Latin America is not encouraging at the moment.

Eventual trend to democracy in the long-range future is offset now by the short-term swing to the left.—By Tom Campbell.

■ The Cuban revolution will adversely affect North American investment in Latin America for some time to come. While expropriation or confiscation will not be the rule outside of Cuba, risk capital will be quite cautious—even in the face of possible government guarantees.

Action to raise the standard of living of the masses in many South American nations will be attempted by the Latin governments in cooperation with the United States' South American project. But even there, practical benefit may be a long time in coming. It takes patience, time, understanding, experienced personnel, knowledgable government people, and a mutual belief that lasting good can be done.

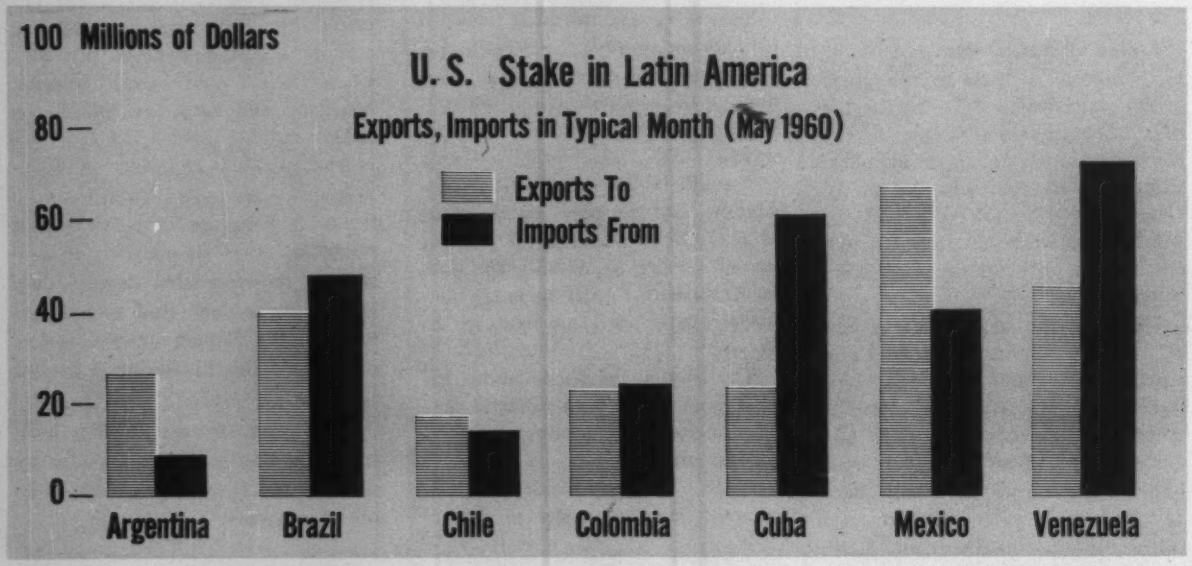
Business Faith Shaken—At the present time, business faith in Latin America is not what it was. Probably the trouble in Cuba has been most responsible for this outlook. But it must be realized that such fits of confidence and lack of confidence have been the rule in Latin American projects for many years. This time, though, it could be different.

Take, for instance, Venezuela. That nation has been and is today one of the greatest friends the United States has in Latin America. That reason is not hard to find: Until recent years, imports from the U. S. ranked next to Canada in tonnage and money value. Of course, one major reason was the oil revenues which were promptly spent in this country.

Trouble Ahead—After the Venezuelan revolution, imports dropped off and business sagged as the nation attempted to take the long, hard road to real democracy. Today, the oil problem is an international one and the Venezuelan economy is caught in a wringer. Since that nation's economy is dependent—at least 80 pct—on oil activity, it is clear that new troubles for the United States' best friend are only starting.

The picture in Venezuela is not far different from many other Latin nations. First, there are new governments which are committed to make democracy work in an area which for years was more-or-less controlled by strong men. It will be quite a feat for South Americans to throw off their worship of strong personalities and replace this with a

What Latin America Means to the U.S.



deep sense of purpose and obedience to a government of law. Even if it is possible it will take far more time than most North Americans would expect.

OAS Action—The action of the Organization of American States in refusing to hammer down too hard on Premier Castro is no surprise to those who have been close to the Latin viewpoint. It is hardly likely that any Latin nation at this time would openly condemn the leader of a popular mass revolution. In the case of Generalissimo Trujillo, it was different. He was a "hated" dictator and not in the general trend of the South American march toward a "new day for the masses."

Risk capital is more cautious than ever. Thus, with the trend for more help to the "people" it is a foregone conclusion that governmental control of attempts at rehabilitation in Latin countries will be the major force. Just how that force will be used and how successful it will be is wide open to conjecture. If future success is no better than our government's attempt to patch up our South American problem in the past, it will take quite a few administrations to work on the project.

Talk to any old timer in the Latin countries—one who genuinely has the future of the country at heart—and your eyes will be opened. The banker-investor viewpoint is easy to understand: "The money we invest belongs to others; we have to watch our step; things look bad in South America with Castroism being exported from Cuba. Therefore, let's wait a while."

To The Left—But many in Latin American nations and in this country see it a different way. They are not sure just how this mass revolution with its divided parties, its cautious and frightened rulers, will make out.

Instead of turning to strong men, as they have in the past, there is evidence that the governments may turn to the left. Here's why:

Communists, although small in number, call many of the shots in some South American nations.

Leftist parties are being faced with splinter groups in their own parties. This leads to troubles which forstall any progress for the nation as a whole. It also provides an opportunity for the Communists to make hay while the "family" fights are in progress.

Respected leaders are neutralized by the forces pulling them in opposite directions. The result often is no action at all.

Oil Background—The oil problem is an international one, a serious one, and one which will become far worse before it will be straightened out. Russia is behind some of this and will stay in the picture stirring up the muddle.

In attempts to close the gap between the very poor and the very rich, all kinds of plans are in discussion phases with little or nothing being done. North Americans are often being blamed for not helping (see box) when the well-heeled people of South America often drag their feet in supporting the very plans they advocate for the masses.

Capital Withdrawn—The flight of capital from some Latin nations has reached such proportions that even if restrictive measures are now taken, it will take years to improve conditions enough to encourage a return of this money. In between now and that time, some dangerous tampering with the economies of many Latin nations may occur—tampering which could scare not only private risk capital, but also could scare the Congress of the United States enough to change drastically whatever plans the U. S. has for assistance.

And, finally, the knowledge that there may never be any more regression to strong man governments which lead to dictatorship because the "chosen one" can't make good on his promises. Where in the old days a new "rightest" dictator appeared, it now looks as if the trend is for civil wars and leftist dictatorships with still more leftist trends—if the current sane attempts to make democracy work fail.

A Latin American Reaction

As part of the background of this story on Latin American attitudes, Editor-in-Chief Campbell offers this excerpt of a personal letter. He identifies the writer as "a young South American lawyer active in one of the political parties."

"Tom, this is the time when it should be admitted that your country was wrong in its foreign policy to us; that in return for the solidarity of your people with the North American democracy, we have been granted a very unsatisfactory treatment.

"Over the years, we have seen how the U. S. played ball with our most gloomy tyrants—how our economic anxiety and state of underdevelopment were met with vague solutions in international meetings . . . while all your efforts were directed to aid not only W. Europe but also disqualified entities like the Government of Chiang and even an enemy like Tito.

"When the government of Poland showed signs of withdrawal from the Soviet bloc, the American politicians could not fly quick enough to offer aid to Gomulka; in the meantime, your Latin American neighbor continued to be the continent of hunger, poverty, and unsatisfied needs."

Industry Tears the Lid Off Cans

Aluminum Gets Fast Punch, Tinplate Slims Down for Fight

Aluminum producers and machinery builders have teamed up to expand the aluminum can market.

But a tinplate producer has rushed a new product into production and hopes to slow the advance.

■ Aluminum is tearing the lid off the can market in more ways than one. And with it may go the traditional reference to the "tin can."

The industry is going all-out to capture this huge container market. It's getting a big assist from machinery manufacturers who are developing new and faster methods for producing aluminum cans.

Tinplate producers realize their virtual monopoly is about to be destroyed—but they aren't giving way gracefully.

Plenty of Progress—Verson Allsteel Press Co. has a new press which will deep-draw aluminum cans at a rate of 200 per minute. National Machinery Co. has a press which slams 120 2-in. aluminum slugs into topless beer cans every minute. A few months ago E. W. Bliss Co. introduced a press which deep-draws 120 aluminum cans per minute.

Minute Maid Corp. earlier indicated it was switching to aluminum cans (The IRON AGE, May 26, 1960, p. 61) in a joint announcement with Reynolds Metals Co. Baldwin-Lima-Hamilton Co. built the canmaking machine, which produces 425 3-piece cans per minute.

Aluminum Company of America, working with United Shoe Machinery Corp., is developing a 3-piece aluminum foil container. Distinctive features: A pull-open top (see photo) and a body made of paperboard sandwiched between aluminum foil.

Pressure Problems — Last year only about 15 million lb of aluminum went into cans. But Kaiser Aluminum & Chemical Sales, Inc., says its earlier estimate of 50 million lb of aluminum for cans in 1960 now appears conservative.

Citrus juice packers account for most of the current surge in aluminum cans. But beer producers are the largest single product market for cans, taking a healthy chunk of the 4.9 million tons of tinplate produced each year.

The beer and canned foods markets require cans which will withstand heat and pressure generated in processing. Three-piece aluminum cans, bonded rather soldered at the seams, aren't suitable. Cracking these markets calls for two-piece, seamless cans—and this accounts for activity on the part of press builders.

Steel Challenged—A big drawback in development of the deep-drawn aluminum can has been the problem of removing it from the male die without ruining the can body.

Verson suggests it has solved this problem with its 200-cans-per-minute press. And at least one can laboratory is working with a machinery manufacturer which has designed a seamless can extrusion press that, on paper at least, will

LIFT TAB AND PULL: Alcoa's new tear-off can top is being tested on aluminum foil-laminate frozen juice containers. It can be used with aluminum or conventional tinplate can bodies as well.

produce cans at a rate of 400 per minute.

Aluminum's success in the can market is at the expense of tinplate. To combat this growing threat, steelmakers embarked on research programs to develop thin tinplate.

Thin Tinplate—U. S. Steel Corp., National Steel Corp., Youngstown Sheet & Tube Co., and Jones & Laughlin Steel Corp. have all been working toward this end. But, because of the steel industry's belated start toward developing thin tinplate, it wasn't expected on the market before next year.

However, U. S. Steel Corp. says it has the answer in a material named Ferrolite. Prices range from $6.10 to $6.65 a base box, the pricing unit for tinplate. Conventional can stock of the type used for citrus juice cans sells for $7.75 a base box.

Ready To Go — Lighter weight and lower price for Ferrolite have been achieved by reducing thickness of both the steel and the tin coating.

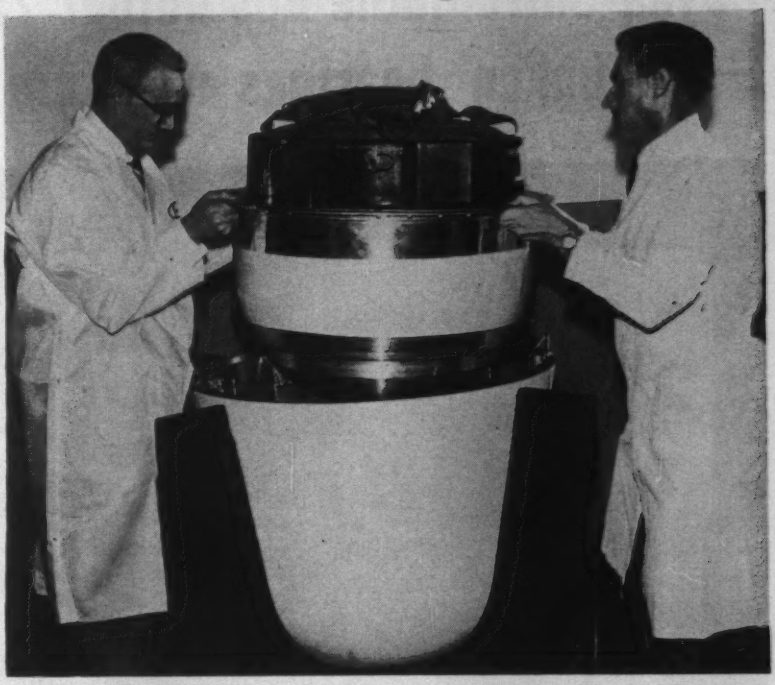
Regarding quantities available, a U. S. Steel spokesman comments: "We would just like to have an order that would tax our capacity." He implied the company is geared to make enough thin tinplate to supply the whole juice can market.

Staying Competitive—However, the aluminum industry isn't alarmed over U. S. Steel's announcement. An Alcoa spokesman says aluminum might run into problems in the oil can market, but it would have an edge in applications that call for gage competition. "We are confident we can remain competitive," he says.

The price competition is already underway—and it is as sharp between aluminum producers as it is between aluminum and steel.

Several sheet producers reportedly have cut the price of aluminum to canmakers. In turn, canmakers have reduced prices for aluminum cans by $1.50 to $2 a thousand. This is said to be aimed directly at Reynolds Metals' program calling for users to make their own cans.

Nose Cone Is Designed for Re-Entry



FOR A SAFE RETURN: A Discoverer satellite capsule is lowered by General Electric Co. technicians into a bowl-shaped heat shield. The shield is designed to bring it safely back from orbit.

New Spec Means Less Red Tape

A step has been taken toward the slicing of red tape covering government contract specifications.

A single specification, common to all specifications for covered welding electrodes, is now available. It was prepared by a special committee of the Arc Welding Section of the National Manufacturers Assn. It is issued by the U. S. Navy Bureau of Ships.

The document is entitled "Military Specification Electrodes, Welding Covered: General Specification. MIL-E-22200."

Engineers in government agencies and private industry will be urged to use the new document. It means that engineers now need only study one or two pages covering any grade of electrode. This is compared with 20 to 30 pages needed to successfully fulfill prior military contracts.

Availability of the new specification also means a saving of more than 50 pct on file space. This will then result in time savings for cataloging and filing.

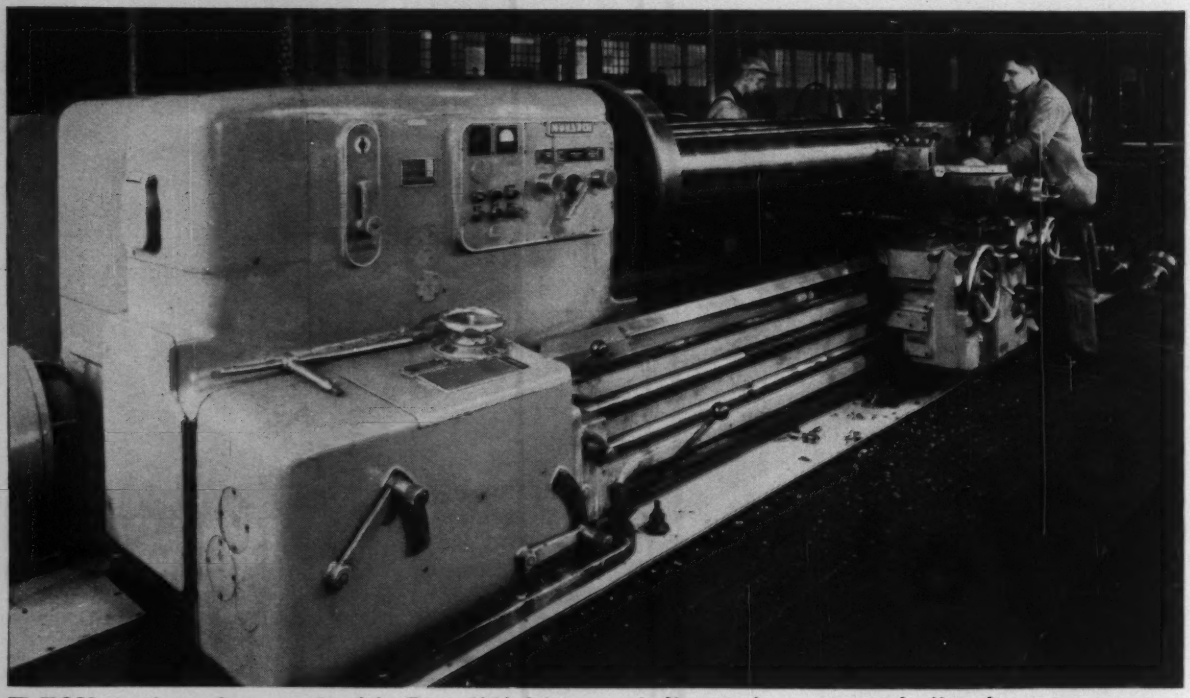
Progress in Cryogenics

The Garrett Corp.'s AiResearch Manufacturing Co., Los Angeles, has operated a remote cryogenic test facility since May, 1958. The recent announcement also notes that the facility was designed and constructed under an Air Force contract.

The facility, located near Boron, Calif., provides full scale component testing with liquid hydrogen. It is capable of evaluating liquid hydrogen pumps and heat exchangers.

The AiResearch test site is composed of three sections—a test area, control area and lab assembly building. The entire facility was built in 1957. It is considered a tool for performance and reliability testing of complete systems and associated components utilizing liquid hydrogen as the test fuel.

"Dyna-Shift" lathe ups output 25%, tool life 50%, —30 Timken® bearings maintain rigidity, accuracy



YOU merely set the controls of the Dyna-Shift drive on this Monarch Series 90 lathe to get the correct speed automatically. What's more, the "90" can be kept under full load at any speed, using modern tooling. Results, reports Monarch, show up to 25% more output and 50% greater tool life than with other equipment. Thirty Timken® tapered roller bearings at vital points—spindle, gear box, apron and tailstock—assure constant rigidity and accuracy, for maximum economy.

Most American machine tool builders use Timken bearings. Two big reasons are: 1) The taper lets Timken bearings take *both* radial and thrust loads or any combination. 2) Precision manufacture of Timken bearings assures high precision in the machine.

EXTRA ENGINEERING SERVICE. Often, our graduate engineer salesmen can solve your bearing problems on the spot, at the design stage, save you time and money.

THE FINEST GAGE LAB in the industry assures you top bearing accuracy. Some instruments we use measure even the thickness of a molecule, split a hair 30,000 times.

Industry rolls on

TIMKEN®

tapered roller bearings

The Timken Roller Bearing Company, Canton 6, Ohio. Cable address: "TIMROSCO." *Makers of Tapered Roller Bearings, Fine Alloy Steel and Removable Rock Bits.* Canadian Division: Canadian Timken, St. Thomas, Ont.

See you at the AISE Show, Cleveland Public Auditorium, September 27-30, Booths 134-137.

Boost Your Whole Company

Maximum efforts will be needed to sell well in today's competitive market.

But they'll be more effective if you also sell the "insiders" — employees, distributors and stockholders.

■ Businessmen are sharpening up their sales and marketing methods. In the light of competitive markets, selling is getting more attention. But, for maximum effect, selling should be directed inward as well as out.

There are many company-connected groups—employees, distributors, stockholders—who can be "sold" more fully on the company's products and policies. The result, of course, is a stronger, more efficient organization.

Moves in this direction can begin with the work force. If employees thoroughly understand the company's position, they will be more in sympathy with it.

Sell the Sellers—The same thing applies to distributors and sales representatives. It's the reason why more companies are spending more time selling the sellers. For the competitive years ahead, they are making every effort to strengthen bonds with distributors.

One company, for example, has even come up with a trade-aid plan for its distributors where the firm's staff services are available to them —without charge.

. . . And the Stockholders—With more and more companies going public—selling shares of stock on the open market—stockholder relations are getting more important.

How favorably the investor regards the company helps decide how much capital it can accumulate for expansion and growth. How shareholders react to new product and market plans helps determine how quickly the company moves ahead —or lags behind.

The number of sophisticated investors and shareholders is growing all the time. But, in many cases, management is not keeping up with this more knowledgeable group.

Some sound thoughts on attracting and keeping investors and shareholders are advanced by the Mermey Organization, a management consultant firm.

"Refreshments at annual meetings, more pictures in the annual report, welcome letters, are for kindergarten investors," says Mermey. Companies could talk "up" to stockholders in these ways: Use annual meetings to present news of major corporate developments. Where advisable bring the meetings to the stockholder.

Put Lists to Work — When a stockholder sells out, why not write him and ask a few sensibly discreet questions? (Marketing men frequently do this with customers that slip away.) Use your stockholder list more often, in more sophisticated ways. Stockholders are markets for a company's merchandise; may form panels for testing new products.

How Much Goes for Defense?

■ Are you convinced that defense spending is the big factor in boosting the Federal budget?

It may seem that way, but the figures prove it isn't so. A check of Federal spending in the post-Korean War period shows civilian expenditures—not national protection costs —have been mainly responsible for a $17 billion increase in the budget in the last ten years.

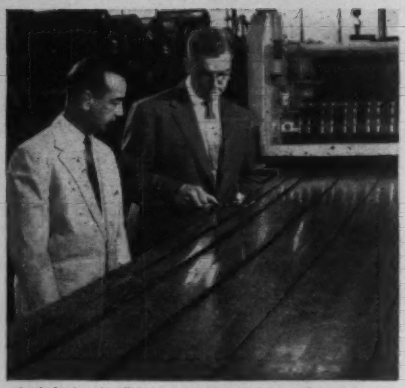
The New Jersey Taxpayers Assn. made the study based on Tax Foundation analyses of Federal budgets. It shows:

Only 2 Pct Boost — Federal spending in 1952 was $65.4 billion and is estimated at $82.7 billion for fiscal year 1961. During this period, spending for national security and international affairs rose about 2 pct. But spending for domestic civilian purposes skyrocketed by 79 pct.

The cost of national protection in fiscal 1961 is about $47.8 billion or $1 billion more than the $46.8 billion spent in 1952. However, in the same period, civilian spending climbed from $19.5 billion to an estimated $34.9 billion for fiscal '61.

Where It Went—Included in this increase was a gain of more than 91 pct for civil benefits, a 62 pct rise in the amount needed for interest on the Federal debt, and a 40 pct boost in the cost of general government.

During an earlier period of time, the span from 1946 to 1952, the same trend was going on.



At left, Leslie Edgcomb, Jr., director of purchases for Edgcomb Steel, looks on as Joseph Drexler, vice president and general manager, checks the width of a slit strand.

Edgcomb Steel expands product range and speeds delivery with Wean slitting line

Edgcomb Steel Company, like so many other metal service centers, has noted a continuing trend toward the purchase of metals in coil form by its customers. The increasing demand for aluminum, stainless steel and carbon steel in this form is due to the lower costs realized by metal users through coil processing. Edgcomb has equipped three of its four plants with slitting lines to satisfy this requirement.

The firm's York plant was set up in 1954 around the Wean slitting line illustrated. Coils, stocked in standard widths up to 48″ and gauges ranging up to .125″, can be slit and side-trimmed quickly and economically to fill customer's orders for narrower widths. Two sets of knives, one for aluminum and one for steel, equip the line to process both metals at speeds up to 800 fpm.

Wean is a leader in the design and construction of coil processing equipment. Whether your operation involves slitting, shearing or stamping metal from coils, Wean can supply the equipment to do the job quickly, accurately and economically. A comprehensive discussion of these operations is contained in a brochure entitled, "Coil Processing." We will be glad to send you a copy if you will send us your request on business letterhead.

WEAN EQUIPMENT CORPORATION
22800 Lakeland Boulevard
CLEVELAND 17, OHIO

WEAN

Wean slitting line at Edgcomb Steel's York plant makes 22 cuts in mild steel on this run for a customer who will form tubing from the slit coils.

AN IRON AGE SPECIAL REPORT TO MANAGEMENT

Reasons for Executive Failure Point Way to Success

By **Dr. F. J. Gaudet**—Director, Laboratory of Psychological Studies, Stevens Inst. of Technology

By shifting research on executives from those who succeed to those who fail, more has been learned on what makes management men tick.

Most failures are due to "personality lacks," not "knowledge lacks."

■ What is it that makes one man a success as an executive and another man a failure?

In order to understand the one, you must understand the other.

Let's take the positive approach first: What is a successful executive?

Executives Stumped—Top executives themselves have trouble describing the "successful executive." Some say flatly that it can't be done, since nobody knows with any accuracy just what an executive job is or the full extent of its requirements. These top executives assert that a job title may mean very little as an indication of what the man in that job is actually doing.

Man vs. Job—Others point out that what is included in a particular management position varies from one company to another because "the job is merely the shadow of the man" — or, "the man makes the job."

It is puzzling why these phrases are so loosely used today. Writers who originated them did not imply that all management men make their own jobs, only that certain eminently successful ones do — those about whom biographies are written. Men who are failures as executives rarely have their biographies published. But this does not mean these men may not have "made their own jobs" and failed as a result.

Probably the definition of the management job most frequently found in current use is this: Managing means "getting things done through people." This definition is supposedly applicable at all management levels from foreman to the top. It is also supposedly applicable in both line and staff organizations.

NEXT WEEK

Are You Willing To Pay the Price?

This is the first part of a series by Dr. Gaudet on the elements that make up executive success.

In Part II, Dr. Gaudet suggests self-analysis of your abilities. He asks the provocative question: Are you willing to pay the price?

Theory Tested—This is a catchy definition. The fact that a man can "get things done through people" at the foreman level is no guarantee that he will be equally competent—or even acceptable—as a superintendent or general manager. Nor does it mean that a man who can "get things done through people" in a staff department will be suc-

Frederick J. Gaudet, Ph.D., is director of the Laboratory of Psychological Studies at Stevens Institute of Technology, Hoboken, N. J. A faculty member at Stevens, Dr. Gaudet was educated at Harvard and Columbia Universities. He has served as consultant to many companies in personnel selection, executive evaluation, and training of supervisory and executive personnel. He is chairman of the board of directors of Psychological Training Devices, Inc., and a Fellow of the American Psychological Association. He is also president of the New Jersey Psychological Association, and a past president of the Metropolitan Association of Applied Psychologists.

cessful at the same level in a line department.

In fact, the "two-track" system of remuneration for engineers and scientists was developed because too many staff managers became complete failures when put into line management positions.

Hard to Measure—The real reason why we don't have meaningful descriptions of managerial positions as gages in determining success or failure, is that we lack techniques for obtaining them. Grotesque as it sounds, the techniques used on hourly workers have been tried on management personnel. This has been done with no success at all, of course.

Another source of information about the characteristics of a good management man are the hundreds of books and articles, mostly authored by top executives and bearing such titles as, "What It Takes to Be a Top Executive," "What I Look For in a Boss," "So You Want to Be a Manager" and the like.

It will be found that most of these authors agree on only two traits which supposedly make for success in management: Good health and high energy potential. Many of the other characteristics are described in such broad terms that they are of little use to the man who is hoping to use them as a yardstick for himself.

The Laboratory of Psychological Studies of Stevens Institute of Technology has been interested for many years in investigating the factors that distinguish between succeeding and failing executives. The Laboratory is concerned because its principal work is helping management select and develop management personnel.

Stevens Studies — The Stevens studies began with a review of literature that revealed the views discussed above. This survey left the investigators with the impression that when top executives write about the characteristics of good management men, they very often describe themselves—either as they think they are, or as they wish they were.

Another approach used by the Laboratory has been to ask executives what type of men they want for specific management positions. Here again, the investigator usually gets broad generalizations. Also, when an executive is asked to describe men he wants for different levels — foremen, superintendents, plant managers, vice presidents — there tends to be a common picture running through all the descriptions. No differences are allowed for the characteristics required for the different levels.

New Approach—Finally, a third and entirely new approach was used by the Stevens investigators. This was to ask several hundred top executives to think of a particular person whom they had promoted to a management position, and who had failed in that position—been fired, asked to resign, been demoted, or transferred to a non-management job.

Having decided upon this particular person whom they had promoted and who had failed, they were then asked to rank, from a checklist, the most important factors causing this man's failure. The items used in the checklist might be classified into two broad categories.

Two Lacks — The first were "knowledge lacks," that is, failures because of: "Lack of knowledge of materials used by the company," "Lack of knowledge of corporate organization," or "Lack of knowledge of labor law and labor relations," and so on.

The other type of items might be broadly called "personality lacks." These were represented in the checklist by such items as: "Lack of drive," "Inability to make decisions," or "Inability to cooperate with others."

Now that the emphasis was shifted from analysis of the successful executive to the failing one, more specific, candid information began to accumulate. When top executives were asked directly what type of lack — knowledge or personality — was more important in causing failure of the men they had promoted, the answer was "personality lacks" over "knowledge lacks" in the ratio of over 10 to 1!

Of course, this is an overall picture. It does not give the relative importance of each of the items in the two categories of causes of failure. These results are given in

Why Top Men Fail: Personality

When Stevens Institute investigators asked top men why executives fail, personality lacks lead knowledge by 10 to 1. Here are the personality defects they listed, with numbers indicating the times mentioned.

Inability to:
- **Delegate Responsibility (91)**
- **Analyze and Evaluate (84)**
- **Judge People (81)**
- **Cooperate With Others (79)**
- **Make Decisions (71)**

Lack of:
- **Drive (60)**
- **Desire to Assume Responsibility (47)**
- **Perserverence (23)**

the boxes accompanying this article.

Variances — Several factors are important as we look over this illustration. The first is that although "personality lacks" as a whole are much more important than "knowledge lacks" as causes, this is not true with every one of the items. For instance, "lack of breadth of knowledge" is more frequently checked than all of the "personality lacks" except "inability to delegate responsibility."

"Lack of perserverence" as a personality lack was checked less frequently than four of the knowledge lack items—lack of knowledge of technical processes, knowledge of marketing and distribution, of personnel organization and inadequate breadth of knowledge.

In addition, "lack of knowledge of corporate organization" was checked the same number of times as was "lack of perserverence." Finally, "lack of knowledge of personnel organization" was checked more frequently than three of the "personality lacks"—lacks of drive, perserverence, and ability to assume responsibility.

Although the meaning of most of these lacks, both knowledge and personality, appear relatively clear, the number of respondents checking "lack of breadth of knowledge" became so high that it was decided to ask a large sample of the executives who checked this item specifically what they meant by it.

Almost all of the replies defined the item in terms of over-specialization where the young executive had clearly made a name for himself in his own field of specialization but knew relatively little about other departments or functions of the business or industry in which he was employed.

Meaning of Findings—What do these findings mean? First, that industry is not going to be able to salvage most of their failing executives. Nor are the men going to be able to save their jobs by becoming better specialists. In many cases, they were unfortunately promoted to the positions in which they failed because they already had made a name for themselves in their own specialized departments.

From the point of view of the aspiring top management man, it should be clear that gaining more and more knowledge in a certain specialized field is not the best way to prepare for a top management position if he has no other skills (technical and social) to offer. Even if his own company thinks he will be a good management man, this is no guarantee of his success.

From these findings it would seem that the man who wants to move up in his company should make special efforts along two lines: He should strengthen his personality factors, and he should acquire greater insight into the broad aspects of his company and his industry.

There are two sides to the personality idea. One is that an executive should himself have strong personal qualities. He should also strive to work more effectively with personalities in his business contacts.

Rating high in an executive's personality profile is ability to make decisions, his perseverance, and his willingness to take on more responsibility. These are areas in which a man with basic raw material can make improvements.

In working with others, two aspects rate high in the opinion of top executives; ability to delegate responsibility, and ability to cooperate with others. These, too, are areas where conscious effort can yield great improvement.

While this has been called an age of specialization, the young executive who hopes to get ahead should have a solid grasp of the overall aspects of the company and the industry.

Company presidents have been called "the lonely men" as the result of one survey. This was because they are the men who make the big decisions. Their subordinates make their recommendations based on possible effect on their own departments or divisions. It is little wonder that when one of the "lonely men" finds an executive with an overall view he feels, "here is a promotable man."

Why Top Men Fail: Knowledge

Gaps in knowledge account for fewer executive failures than personality defects, top business leaders say. But those surveyed mentioned these reasons for failure:

Lack of Knowledge of:
- **Overall Company Objectives and Operations (85)**
- **Personnel Organization and Administration (69)**
- **Marketing and Distribution (28)**
- **Technical Processes (25)**
- **Corporate Organization (23)**
- **Risk Bearing and Liability (23)**
- **Accountancy (15)**
- **Labor Law and Labor Relations (10)**
- **Finance (9)**
- **Materials (6)**

Reprints of this article are available as long as the supply lasts. Write Reader Service, The IRON AGE, Chestnut & 56th Sts., Philadelphia 39, Pa.

Ask for Reprint **No. 102.**

STAINLESS . . . BEST FOR HARD KNOCKS

UNILOY
STAINLESS STEELS

Thump it—rap it—scrape it! High strength stainless steel stays unscathed . . . stays unrivaled for body and fender protection. It's the *one* metal that completely meets the demands of today's quality-conscious, value-minded market.

And today, more and more fabricators of stainless trim and functional parts specify Uniloy for improved formability and product quality. Call Universal-Cyclops for Uniloy Stainless Steel in the exact grade and finish you need.

UNIVERSAL CYCLOPS
UC STEEL
STEEL CORPORATION
EXECUTIVE OFFICES; BRIDGEVILLE, PA.

STAINLESS STEELS • TOOL STEELS • HIGH TEMPERATURE METALS

How Chevy Hopes to Set Record

Expansion of Corvair Lines Key to 1961 Production

Division boss E. N. Cole says Chevrolet production should set a record this year, and another new high in 1961.

Corvair line will be expanded with addition of five new models.—By A. E. Fleming.

■ Chevrolet, two-thirds of the way through its best production and sales year, expects to do even better in 1961.

E. N. Cole, division general manager, says sales of Chevrolet cars and trucks are running 15 pct ahead of record 1955. He predicts sales for the entire year will reach 2,085,000. The company's record of 2,066,000 units was set in 1955. The auto executive expects Chevrolet sales to exceed 2 million units and to surpass this year's expected record.

Corvair Line Expanded—To accomplish this, the compact Corvair line will be expanded by addition of a stationwagon, two van-type vehicles, and two pickup trucks. These will be in addition to the two and four-door sedans and sporty two-door Monza. Basic styling is unchanged.

A four-door stationwagon, named the Lakewood, uses basic chassis components from the Corvair. The Greenbrier Sports Wagon is a 6-passenger vehicle, or 9-passenger with optional third seat, aimed at the small school bus and camping markets. A companion to the Greenbrier is a commercial vehicle with a panel body, aimed at small businesses.

One of the two pickup trucks features side-loading, aided by a special swing-down ramp.

Corvair Changes—In an attempt to solve some of the earlier complaints about Corvair, particularly high fuel consumption of the gasoline heater, the company is switching to a hot-air heater.

However, the gasoline heater will also be offered for buyers willing to sacrifice fuel economy for instant heat.

Shorter, Narrower — Styling for the 1961 Chevrolet has been "softened." The gull-wing design of the rear section is gone and the car appears much more square. The cars are 1.5 in. shorter and 2.4 in. narrower. Hardtop models are slightly higher, but sedans are slightly lower than 1960 models.

Mr. Cole predicts sales of 6.5 million domestic cars and 450,000 foreign cars in 1961. Production of the Corvair will be increased from 251,000 for the 1960 model year to 300,000 to 350,000 in 1961. About 50,000 of these are expected to be the new trucks.

1961 Hawk Retains Its Distinctive Styling

LIMITED EDITION: Production of the Studebaker Hawk for 1961, which retains the distinctive lines of previous years, will be limited to 6100 units. New features include bucket seats and redesigned fins.

Blast It Better!

Add bigger savings with
ARROW-BLAST abrasive*

Pressure blasting saves you time and trouble in plenty of metal cleaning jobs.

But that's only part of the economy story.

With Norton ARROW-BLAST abrasive you get other important savings. ARROW-BLAST abrasive is composed of ALUNDUM* fused alumina grains — characteristically hard and sharp for extra fast cutting action — tough, strong and blocky for high resistance to breakdown.

That's how ARROW-BLAST abrasive assures longer, more useful service life and lower cleaning costs. Also, contrasted with sand-blasting, ARROW-BLAST abrasive cleaning eliminates hazards. Dust is held to a minimum, allowing maximum visibility.

For maximum savings in compression cleaning, add Norton NORBIDE* pressure blast nozzles. Molded of the man-made material that's next to diamonds in hardness, NORBIDE nozzles last longer than any other you can buy, and give exactly the type of cleaning stream you need, from broad to pencil-thin. For quick service on ARROW-BLAST abrasive and NORBIDE nozzles, see your Norton Distributor. Or write to NORTON COMPANY, General Offices, Worcester 6, Mass. Plants and distributors around the world.

*Trade Marks Reg. U.S. Pat. Off. and Foreign Countries

NORTON
ABRASIVES

G-402

75 years of . . . Making better products . . . to make your products better

NORTON PRODUCTS: Abrasives • Grinding Wheels • Machine Tools • Refractories • Electro-Chemicals — **BEHR-MANNING DIVISION:** Coated Abrasives • Sharpening Stones • Pressure-Sensitive Tapes

Mild Upturn Noted in Farwest

Executives Predict a Good Final Quarter Pickup

Farwestern steel executives feel this year could end on a good note. They predict fourth quarter sales will be up.

Allied industries also look for end-of-the-year business. Fabricator's inventories of aluminum are low.—By R. R. Kay

■ The "Soaring Sixties" are thus far a disappointment to Farwestern steel executives. However, they're confident that the year will end on a good note.

H. H. Fuller, vice president, Bethlehem Steel Co.'s Pacific Coast Div., told The IRON AGE, "For the first time in several months, our current steel sales are exceeding shipments."

He adds: "There are signs that our July steel operating rate of 55 pct will be the low point of the year. We look for some gradual improvement during the rest of 1960."

Mr. Fuller notes, "This estimate is supported by our new orders in August that are coming in at a rate of 60 pct of capacity."

Fourth Quarter Upswing — Another prediction is made by C. F. Borden, executive vice president of Kaiser Steel Corp: "Our customers are consuming steel at a high level. But as yet, this is not reflected in a pickup of our orders. We do expect an improvement in demand starting early in the fourth quarter."

The Columbia-Geneva Div. of U. S. Steel Corp. is already feeling a pickup in operations. Largely responsible for this is the giant pipeline that will bring Canadian natural gas into the San Francisco Bay area. This project alone will consume 300,000 tons of steel.

Farwestern steelmakers hope that projects initiated by the natural gas industry will help create a high demand for their products this year and next.

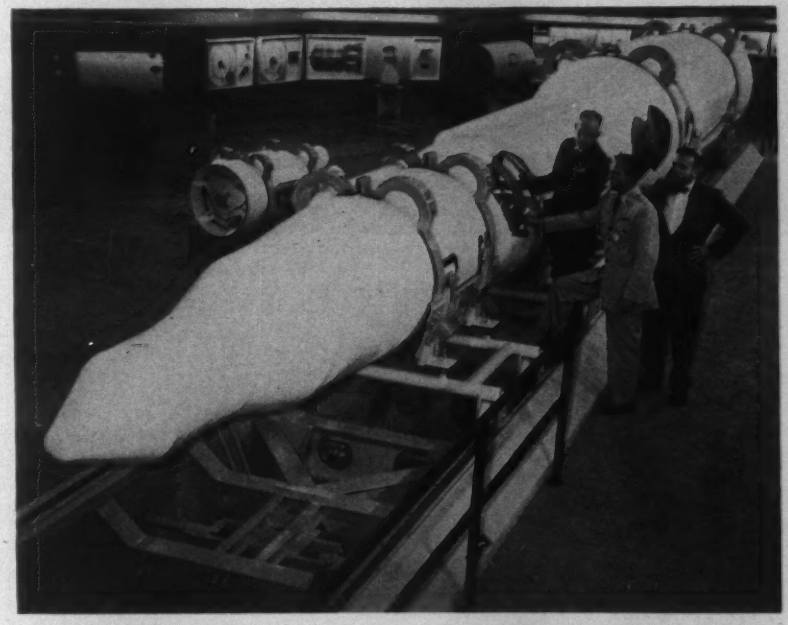
More Steel Shipments—How will Farwestern steel shipments compare with 1959? One top industry executive figures the total will "exceed last year's by about 5 pct."

Allied industries also expect a final quarter pickup. F. M. Cashin, vice president and general manager, Kaiser Refractories and Chemicals Div., is confident of a good year. He predicts the end-of-the-year sales will follow the upswing "steel spokesmen are predicting for the fourth quarter."

Aluminum Hopeful Too — Mr. Cashin says, "We are predicting that our total sales volume for the last six months will be about the same as the first six months which, by most standards, was good."

The aluminum industry is planning to share in the sales improvement, too. D. A. Rhoades, president, Kaiser Aluminum and Chemical Div., told The IRON AGE, "Inventories in the hands of fabricators are now at low levels. So it's reasonable to expect an increase in the aluminum shipping rate."

Minuteman Passes Another Milestone



TO THE HEAD OF THE CLASS: The Air Force Minuteman ICBM passed another milestone recently with the successful completion of the Development Engineering Inspection at the Seattle, Wash., plant of Boeing Airplane Co. Minuteman can be fired almost instantaneously.

YOU GET COMPLETE INSPECTION WHEN YOUR "SPECS" READ HYATT

Hyatt Hy-Roll bearings are constantly checked through every stage of production. But performance is the payoff. And, that's why Hyatt insists . . . without exception . . . that every metric series Hy-Roll bearing be run on a special fixture to check noise level as a final test for quality. It's another of the many secrets of Hyatt reliability. Hyatt Bearings Division, General Motors Corporation, Harrison, New Jersey.

Replacement bearings available through United Motors System and its authorized bearing distributors.

HYATT HY-ROLL BEARINGS

IN ROLLER BEARINGS HYATT IS THE WORD FOR GM GENERAL MOTORS RELIABILITY

Aluminum Engines Pose Problems

Engineers Must Revise Old Transfer Lines

With a spurt of aluminum engines expected this year, manufacturers are faced with problems.

Many machine tools were not designed for aluminum speeds. Plants don't have the experience to quickly solve the problems. —By R. H. Eshelman.

■ With a rash of aluminum engines expected this year, manufacturing engineers are facing problems of debugging first high-volume transfer lines for the light metal.

Many machine tools were not designed for the high operating speeds that should be used for aluminum, observe field engineers of Wesson Co., Ferndale, Mich. In milling, for example, they report that the lowest successful speed is 700 sfpm. In some cases this proves to be the top speed of the machine.

Recommended starting speed for aluminum is 1000 sfpm. One new automation line for conventional design aluminum heads mills at 5000 sfpm. Another case, where the top speed known is 38,000 sfpm, is said to give extremely good results.

Plants Lack Experience — So far, few plants have had sufficient production experience in machining aluminium cylinder heads and blocks. But, as a designer and builder of automation lines, The Cross Co. has noted some tendencies.

According to Kurt O. Tech, vice president of engineering, problems in diecasting have a way of translating themselves into later machining problems.

Porosity, of course, cannot be permitted in any section that must be oil or water tight. Yet it sometimes results from insufficient flow of molten metal. To solve the problem, silicon may be added. Result is a high-silicon aluminum alloy that is very abrasive and leads to shortened tool life. This switch cannot be anticipated from original material specs.

For 1961 Autos—Cutting fluids are also proving important. In milling operations, one good solution is being applied to 1961 auto production: A cutter with an intermediate coolant reservoir near the hub. Radial holes lead toward the blades. Centrifugal force directs a powerful stream of fluid to the exact point where needed.

Other problems are being solved, too. Recommendations for axial and radial rake angles in turning and boring are being developed. Another problem is dealing with the sticky characteristics of aluminum chips.

Attention to design holds here, too. Machine designers keep obstructions such as clamps and clamp screws out of the path. Where interference can't be avoided, tooling is polished or chrome-plated.

More than Machines — Production machining of large aluminum die castings involves more than machines, cutting fluids and tools, and engineer's stress. Extra material allowances on sealing surfaces can help.

And a full die-casting cycle—especially time for adequate cooling in the die—is vital to avert processing troubles.

TO ROUGH MILL: A new eight-station transfer machine has been designed by Snyder Corp. The machine rough mills aluminum automotive cylinder heads at the rate of 120 pieces per hour.

INDUSTRIAL BRIEFS

Coke Oven Battery — Granite City Steel Co. will build a battery of 61 coke ovens and a high-speed continuous annealing line to process light gage steel for tinplate. Construction underway and previously scheduled will increase annual open-hearth capacity from 1440 million tons to 1740 million tons by 1962. Additions to rolling and finishing departments will increase production of cold-rolled products, including galvanized and tinplate.

Metal Treating Symposium — A metal treating symposium is scheduled for the New Englander Motor Hotel, Westport, Conn., Nov. 3. It is sponsored by the American Gas Assn. in cooperation with the Bridgeport Gas Co., which will act as host company, and other Connecticut utilities.

Good Sub Business — Ingalls Shipbuilding Corp., Birmingham, Ala., plans to build a nuclear-powered submarine costing more than $23 million. It has four nuclear subs now under construction at its Gulfport, Miss., shipyards. The diesel electric sub attached to the Navy on the Pacific Coast was recently delivered by the company.

Moves From Cuba — Clark Equipment International, C. A., opened new headquarters at Centre International Rogier, Brussels, Belgium. Headquarters formerly were in Havana, Cuba. Clark International is the overseas subsidiary of Clark Equipment Co., manufacturer of materials handling equipment, construction machinery, truck trailers and automotive components.

Alone Again—H. W. North Co., Inc., recently affiliated with National-U. S. Radiator Div., Crane Co., resumed independent operations. It will design and supply chemical process equipment and special purpose machinery. New sales and engineering headquarters have been established at a suburban location in New Cumberland, Pa.

A Change in Name—Aluminum Foils, Inc., changed its name, effective Sept. 1, to Consolidated Aluminum Corp. The company is an independent producer of aluminum foil and coiled sheet, and is a domestic manufacturer of super purity aluminum.

A New Home—A new building is under construction in Bear Hill Park, Route 128, Waltham, Mass., for F. W. Derbyshire, Inc., machine tool builders. The corporation will move its entire facilities from their present quarters on High St., Waltham, to the new location this fall.

Move to Electrical—In an expansion move, Republic Steel Corp. is installing Allis-Chalmers Mfg. Co.'s electrical distribution equipment in a new 134-in. reversing plant mill being built in Gadsden, Ala. Determination of the new mill's distribution equipment needs was made by computer machine calculations carried out at the Univ. of Wisconsin and Allis-Chalmers.

A Mass. Purchase — Crowell Tube Co., Inc., Lexington, Mass., was purchased by Nuclear Metals, Inc., Concord, Mass. Crowell produces small diameter metal tubing. It will continue to operate as a separate organization with D. G. Crowell retained as a consultant and a member of the board of directors.

"You'll laugh when I tell you what they said about your bid."

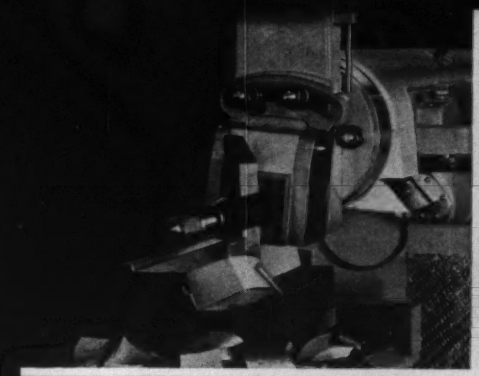
A New Company—B. F. Post, former research and development engineer in the abrasive field, has formed Custom Abrasive Products Co., Inc., with offices at 373 W. State St., Trenton, N. J. The company will handle sales and technical services to the metal finishing trades in the Middle Atlantic and New England states. It specializes in barrel and vibratory finishing media and compounds and pressure blasting abrasives.

Sells the Business—U. S. Industries, Inc., sold the business and principal assets of its USI Montebello Div. to H. W. Loud Machine Works, Inc. The sale included 200,000 sq ft of plant space and 20 acres of land in Montebello, Calif. USI retains title, however, to an additional 16 acres of land adjoining the plant.

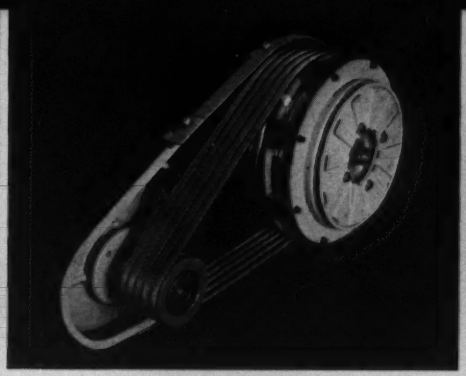
A New Link — Hewitt-Robins, Inc., Stamford, Conn., plans to acquire Union Chain & Mfg. Co., Sandusky, O., manufacturers of conveyor and power transmission chains and sprockets. Hewitt-Robins will operate Union Chain as a division, with E. F. Emmons, now president of Union Chain, heading the new division.

Forms Subsidiary — Premier Industrial Corp., Cleveland, formed a subsidiary in Toronto, Canada. It will market the company's industrial maintenance products and provide related technical services throughout Canada. The subsidiary, Premier Fastener, Ltd., will offer products and services of the Cleveland company's Fastener and Autoware Divisions.

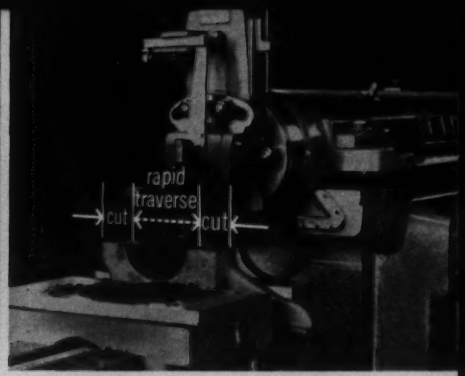
Papers and Talks—The seventh national symposium of the American Vacuum Society will be held Oct. 12-14 at the Cleveland-Sheraton Hotel, Cleveland. The program will include over 70 papers and a panel discussion on "Pressure Measurements — Their Apparatus and Techniques." Dr. Ira Abbot, director of advanced research program for NASA, will be guest speaker.



1. This 2" cut, .030" feed, proves the ability of the Cincinnati's 50 psi automatic lubrication to maintain oil films under the heaviest loads.

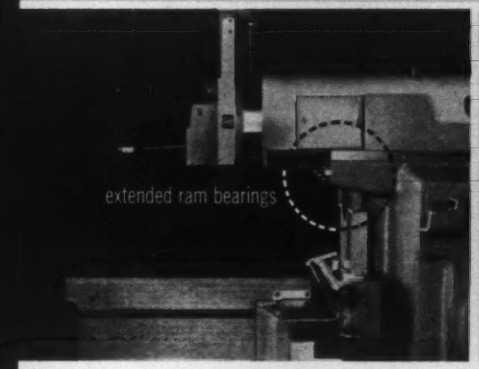


2. Brushless electromagnetic brake and clutch insure fast, easy operation of the ram without grab. They never need adjustment.

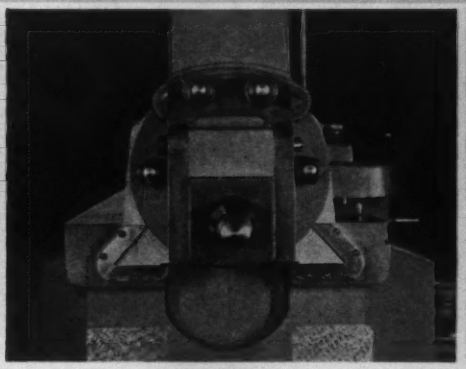


3. Both vertical and horizontal rapid traverse are standard Cincinnati features which profitably reduce time between each cut.

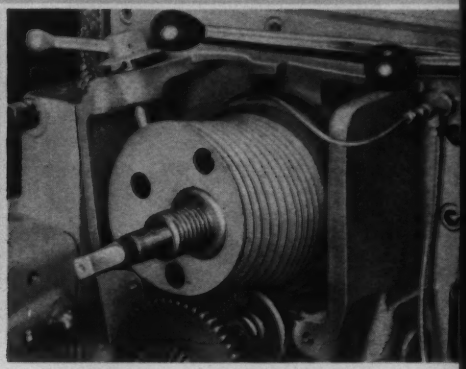
4. Extended ramway bearings increase ram support and minimize wear. Full table clearance to column provides the closest-coupled combination in the field.



5. Solid ramways, free of joints, hold the accuracy of Cincinnati shapers longer than others. Vee ways are cast integrally with the column for extra strength.

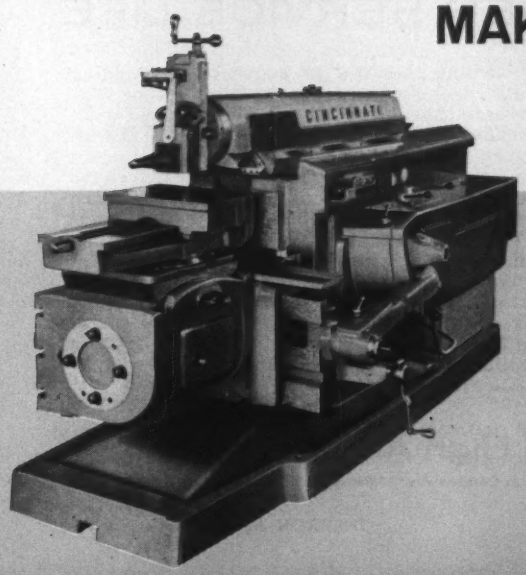


6. Individual cams for each feed, with follower always in contact give you a smooth (instead of a "bump") feed; results in superior finish on every job.



payoff features

MAKE CINCINNATI® SHAPERS YOUR BEST CHOICE

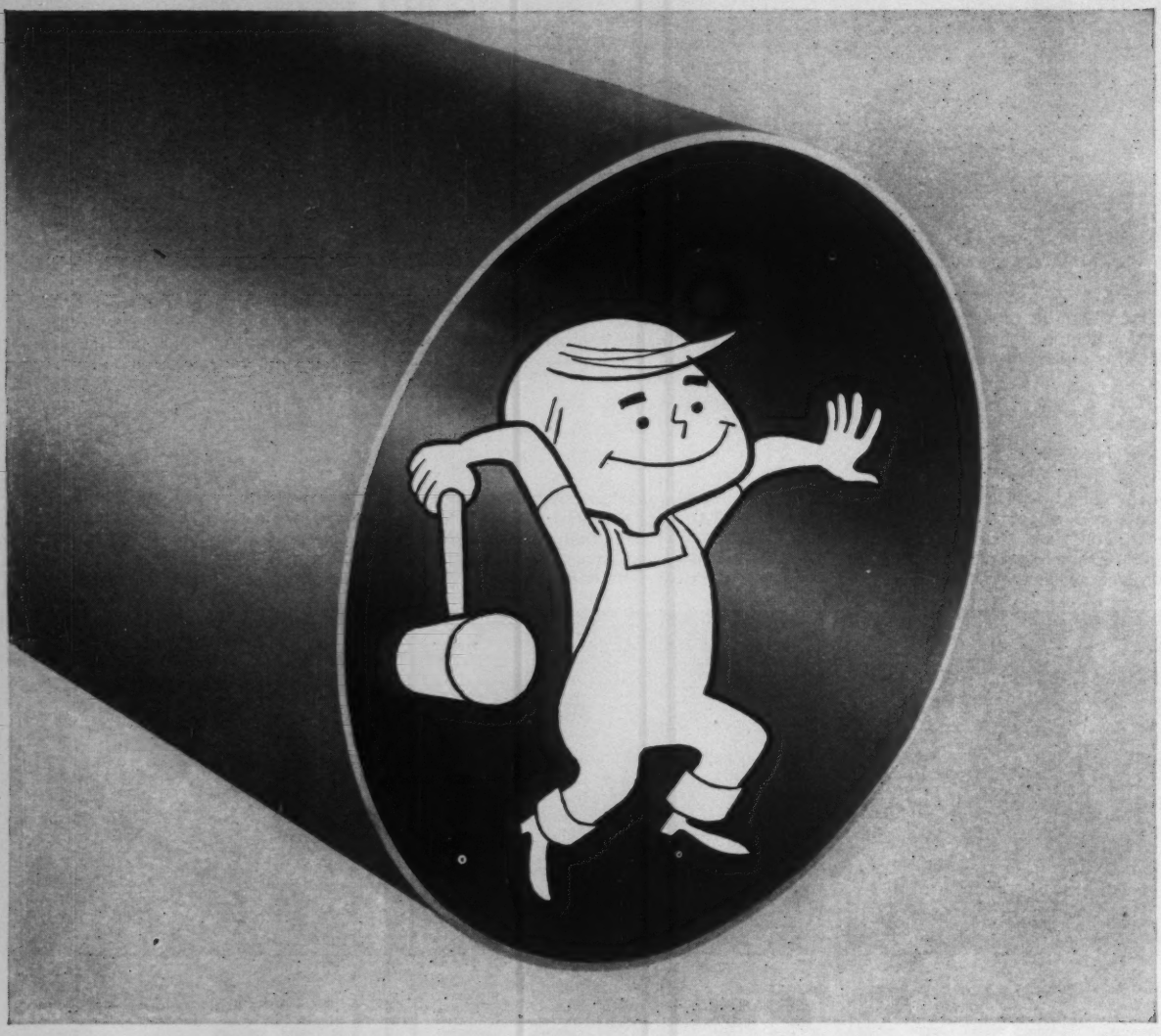


Shapers / Shears / Press Brakes

THE CINCINNATI SHAPER CO.

Cincinnati 11, Ohio, U.S.A.

In Scotland: The Cincinnati Shaper Co., Ltd., Glasgow



"The Gravity Kid" shows why

CONTOUR-WELDED TUBING OFFERS GREATER FATIGUE STRENGTH, LONGER SERVICE LIFE

Tubing fatigue strength depends largely *on how the tube is welded,* and the results obtained. Tubing that's smooth inside — free of flaws and bulging weld beads — offers much greater fatigue strength and longer service life.

Contour-welded* *tubing is smoother inside* than conventionally-welded tubing. It's smoother because *it's welded at the bottom.* Gravity pulls the metal down so that the weld corresponds to the tube's inside contour. There's no bulge on the inside surface. Even on the outside, the seam closely conforms to the tubing shape.

Contour-welding provides greater strength than conventional welding, because in conventional welding, gravity pulls the molten metal down into the tube. This can form a bead that is difficult to remove by cold working. And cold working can lead to deep, sharp undercuts that seriously weaken the tube.

Contour-welded tubing is smoother than seamless, too. That's because it's formed from uniformly rolled strip steel; whereas, seamless is produced by extruding or piercing. This strip is 100% inspected. So, there are no undetected tears or fissures inside.

See for yourself why Contour-welded tubing offers greater fatigue strength, longer service life. Write today for our free 48-page manual which describes tubing sizes from 1/8" to 40" O.D., in stainless and high alloy steels, titanium, zirconium, zircalloy, and Hastelloy**.

*U.S. Patent 2,716,692

**Trademark Haynes Stellite Co.

TRENTWELD® Stainless and High Alloy Tubing

Trent Tube Company, a Subsidiary of Crucible Steel Company of America, General Offices and Mills: East Troy, Wisc.; Fullerton, Calif.

Donald H. McIver

He Heads the Big Tool Show

A leader in the machine tool industry, Mr. McIver now is directing the National Machine Tool Builders' Exposition.

His knowledge of the industry coupled with high respect by associates make him a top man for the job.

D. H. McIVER: For relaxation: Boating with his son.

■ The selection of Donald H. McIver, Vice President in Charge of Industrial Sales, Ex-Cell-O Corporation, as Chairman of the 1960 Exposition Committee of the National Machine Tool Builders' Association was a tribute to his ability for organization for action. Since these expositions are held every five years his work in preparing for the 1960 exhibit has extended over a period of two years.

In regard to the Exposition Mr. McIver states, "In the Sixties the industries to which we sell will go through a period of expanding markets and a growing need for new production facilities and the modernization of old ones. We have machine tools today that produce faster, more accurately and at lower cost than we could have imagined even five years ago.

Some for All—"We urge not only production administrators, engineers and supervisors to attend this Exposition, but business executives, government officials at all levels, educators and civic and business leaders everywhere. We want to show you what the machine tool industry means to our country."

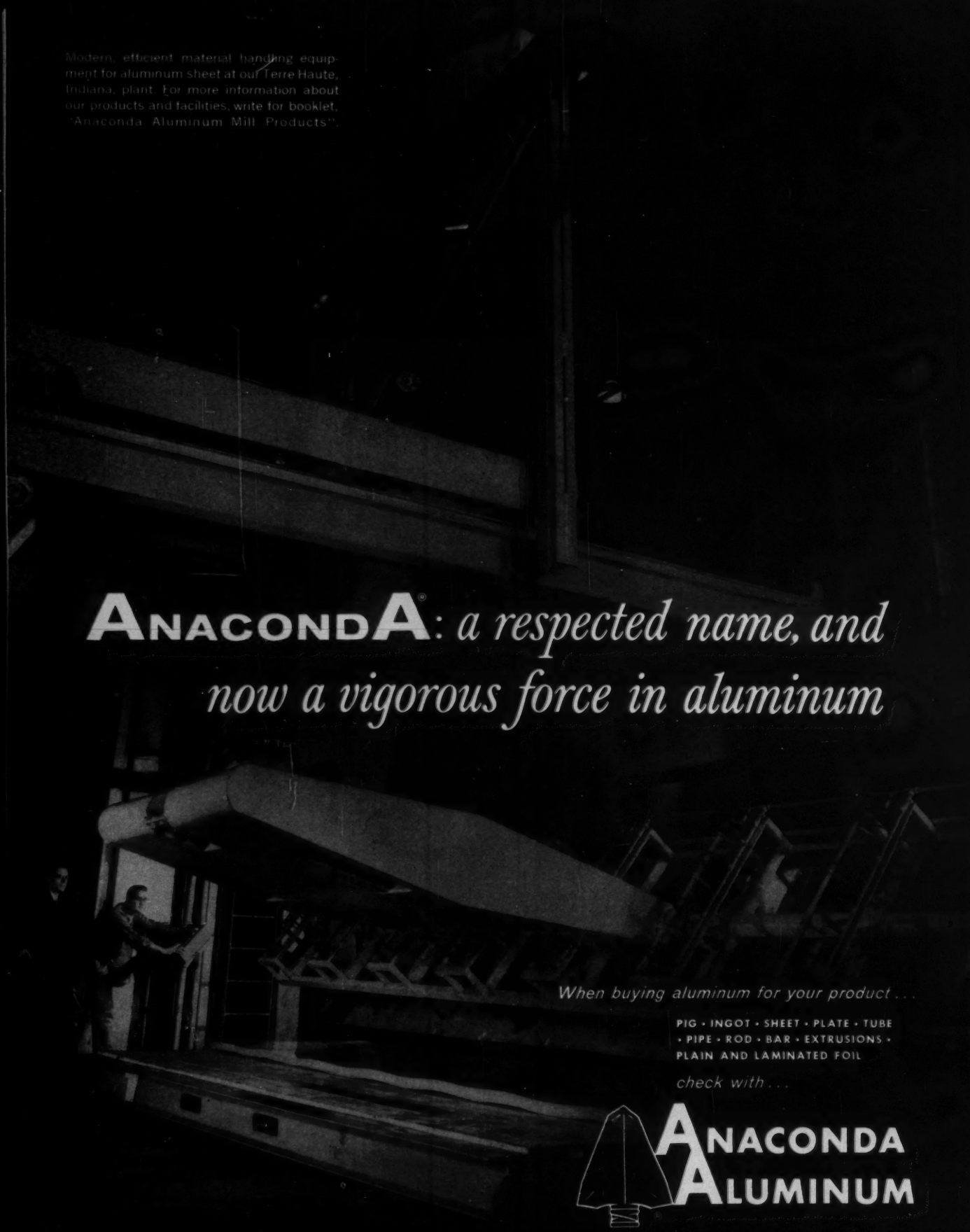
Mr. McIver's record is the story of a man who has built a successful career in sales, although he didn't plan to be a salesman. As a mechanical engineer, he was interested in plant supervision and administration. When he had charge of the Production Control Dept. of Ex-Cell-O in 1934 a vice president asked him to take a temporary sales assignment. Mr. McIver accepted reluctantly. But he handled it so well that he has been in sales work ever since.

High Respect—Other members of the management team consider Mr. McIver a conservative Scot. But his analysis and handling of sales problems and his canny predictions of sales trends have earned him the respect of the whole organization and industry.

Mr. McIver does not run the sales organization from his office. He can often be found huddling with the engineers on design and production problems or showing visitors new machines or new processes in the plant. He knows what machines are on the assembly floor and what contract work is being processed in the various departments.

Rapid Growth—In the nine years that Mr. McIver has been a vice president, Ex-Cell-O has expanded so rapidly in both variety of products and number of plants that sales problems have multiplied like rabbits. He has built a sales organization that completely blankets the country.

Away from his busy desk, Mr. McIver turns to boating with his 37-ft sedan cruiser he keeps docked at the Detroit Yacht Club.



Modern, efficient material handling equipment for aluminum sheet at our Terre Haute, Indiana, plant. For more information about our products and facilities, write for booklet, "Anaconda Aluminum Mill Products".

ANACONDA®: *a respected name, and now a vigorous force in aluminum*

When buying aluminum for your product . . .

PIG • INGOT • SHEET • PLATE • TUBE • PIPE • ROD • BAR • EXTRUSIONS • PLAIN AND LAMINATED FOIL

check with . . .

ANACONDA ALUMINUM

ANACONDA ALUMINUM COMPANY • GENERAL OFFICES, LOUISVILLE 1, KENTUCKY

Robert Potter, elected chairman of the board, E. W. Bliss Co.

Norma-Hoffmann Bearings Corp. —**H. A. Baxter,** elected vice president, engineering.

Irving Subway Grating Co., Inc. —**R. D. Brown,** elected executive vice president.

Burroughs Corp.—**H. G. Bowles,** promoted to vice president and controller.

Textile Machine Works—**A. E. Edwards,** appointed asst. vice president, manufacturing.

The Cleveland Cap Screw Co.— **R. P. Schultz,** named treasurer and **W. G. Bratton,** asst. treasurer.

Vanadium - Alloys Steel Co. — **E. W. Kalb,** named manager, market development.

Olin Mathieson Chemical Corp. —**R. M. Furlaud,** named vice president and general manager, International Div.; **H. A. Arnold,** named a senior advisor of the corporation; **Gordon Grand, Jr.,** assumes responsibilities of the office of the general counsel and appointed vice president, law and administration; **A. T. Safford, Jr.,** named corporate vice president, marketing.

Controls Co. of America—**J. H. Schellman,** elected vice president.

Howe Sound Co.—**A. H. Charlton,** appointed vice president.

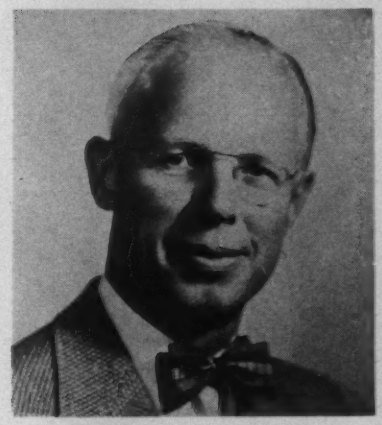
E. W. Bliss Co.—**R. E. Rassel,** appointed manager, automotive press sales.

Clearing Div., U. S. Industries, Inc.—**J. W. Rayner,** appointed administrative assistant to president.

Stromberg-Carlson Div., General Dynamics Corp.—**A. E. Linkins,** appointed director, contracts management.

Frank Samuel & Co.—**Anthony Demos,** named manager, metallurgical sales.

American Forge & Manufacturing Co.—**D. D. Kreisberg,** named superintendent, production control.



J. R. Patterson, elected president and chief executive officer, E. W. Bliss Co.

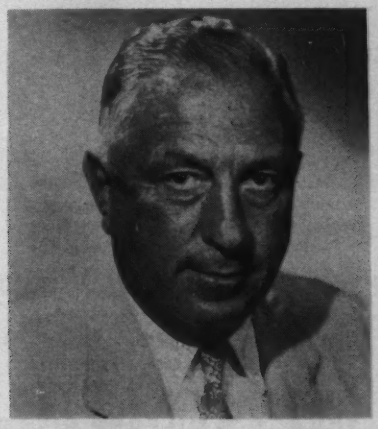
Allis-Chalmers Mfg. Co.— **Thomas Etling,** appointed asst. manufacting engineer, and **J. L. Sutton,** asst. foreman, Material Control Dept.

The H. M. Harper Co.—**G. C. Burke,** appointed district manager, Indiana.

John Bean Div., Food Machinery & Chemical Corp.—**A. F. David,** promoted to manufacturing manager; **Walter Follette,** promoted to purchasing agent, and **Harold**

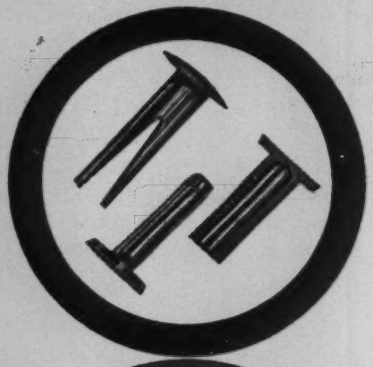
F. Q. Wilson, appointed vice president, marketing, Waterbury Farrel Foundry & Machine Co., Div. of Textron Inc.

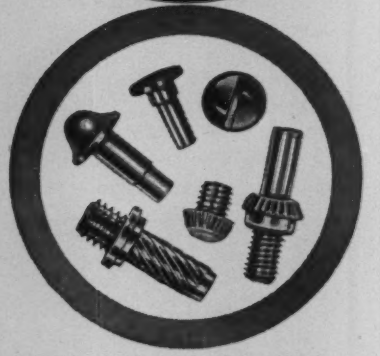
M. L. Herzog, named vice president and general manager, Metals Div., Olin Mathieson Chemical Corp.



N. H. Collisson, appointed senior vice president and chairman, staff committee, Olin Mathieson Chemical Corp.

COST PREVENTION... NOT COST REDUCTION... IS THE EFFICIENT WAY TO LOW-COST ASSEMBLY





The 'in-place' cost of a fastener is what really counts to cost-conscious production men. By deciding on inexpensive Milford tubular rivets as a fastening method and installing them with Milford automatic rivet-setting machines, design and production engineers are eliminating costs at the initial production stage rather than trying to reduce costs later at the assembly line. Write for more information.

THE MILFORD RIVET & MACHINE CO.

MILFORD, CONNECTICUT • HATBORO, PENNA.
ELYRIA, OHIO • AURORA, ILL. • NORWALK, CALIF.

Groesbeck, becomes asst. purchasing agent.

Aluminum Co. of America—**J. R. Roney,** appointed manager, laminated aluminum foil sales; **A. R. McNitt,** appointed manager, food closure sales.

R. E. Hanes, appointed vice president, operations, Foundry & Mill Machinery Group, Blaw-Knox Co.

Minneapolis - Moline Co., Construction Equipment Div. — **B. F. Whitbread,** appointed sales manager.

American Brake Shoe Co.—**J. F. Ducey,** appointed director, acquisitions.

Hauck Manufacturing Co.—**J. E. Zwit,** appointed sales manager, Engineering Division.

F. H. Vandenburgh, named vice president and sales manager, Oregon Metallurgical Corp., Albany, Ore.

R. W. McLaughlin, appointed general manager, Ridgway, Pa., operation, The Elliott Co., Div. of Carrier Corp.

Westinghouse Electric Corp., Standard Control Div. — **W. T. Rush,** appointed sales manager.

Conoflow Corp.—**J. A. Fairbank,** appointed Philadelphia district manager.

A. O. Smith Corp., Welding Products Div.—**J. H. Rees,** named sales representative, new Washington, D. C., division office.

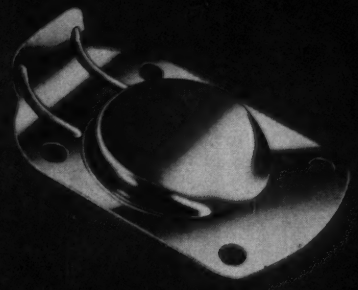
M. M. Rand, appointed manager, carbon electrodes and refractories, National Carbon Co., Div. of Union Carbide Corp.

E. W. Bliss Co.—**Belmont Pinney,** appointed asst. division manager, Hastings, Mcihigan Division.

The Carpenter Steel Co.—**W. K. Kise, Jr.,** appointed asst. manager,

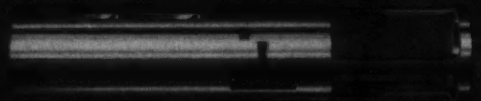
(Continued on P. 88)

you can blank it...



you can forge it...

you can polish it...



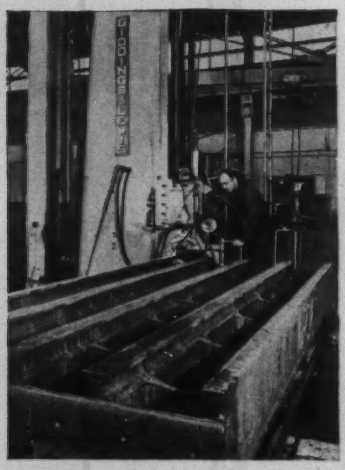
but you can never, no never, change its **consistent uniformity!**

...and that means maximum production, accurate conformity to specifications, fewer rejects and increased profits with Carpenter Specialty Stainless ...produced by one of the leaders of stainless steels for industry.

Carpenter steel

you can do it ***consistently*** better with Carpenter Stainless Steels for specialists

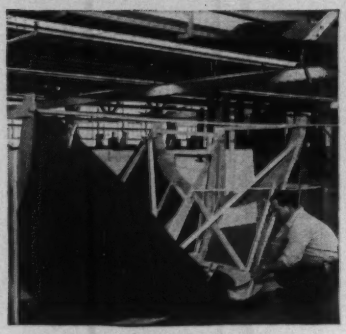
The Carpenter Steel Company, Main Office and Mills, Reading, Pa.
Alloy Tube Division, Union, N. J.
Webb Wire Division, New Brunswick, N. J.
Carpenter Steel of New England, Inc., Bridgeport, Conn.



Reversible center section for 13 foot, 2 inch wide pallet being machined on horizontal boring mill. End section must be held to close tolerances to receive axles, which are pressed into place.

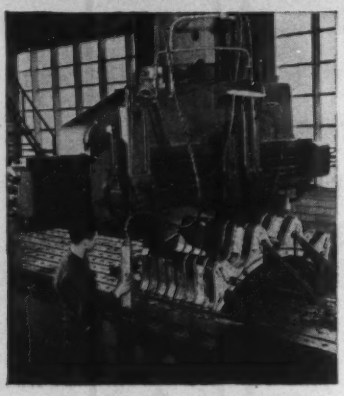
Wheel body for pallet drive on 26-foot vertical boring mill. The edge to which gear teeth are to be attached has already been machined, and the drive shaft hub is being bored.

A pre-installation test of circular sinter cooler in Dravo's Neville Island yards. Method of dumping the pans can be seen at the right rear. This particular feature of the Dravo-Lurgi cooler prevents excessive sinter breakup.



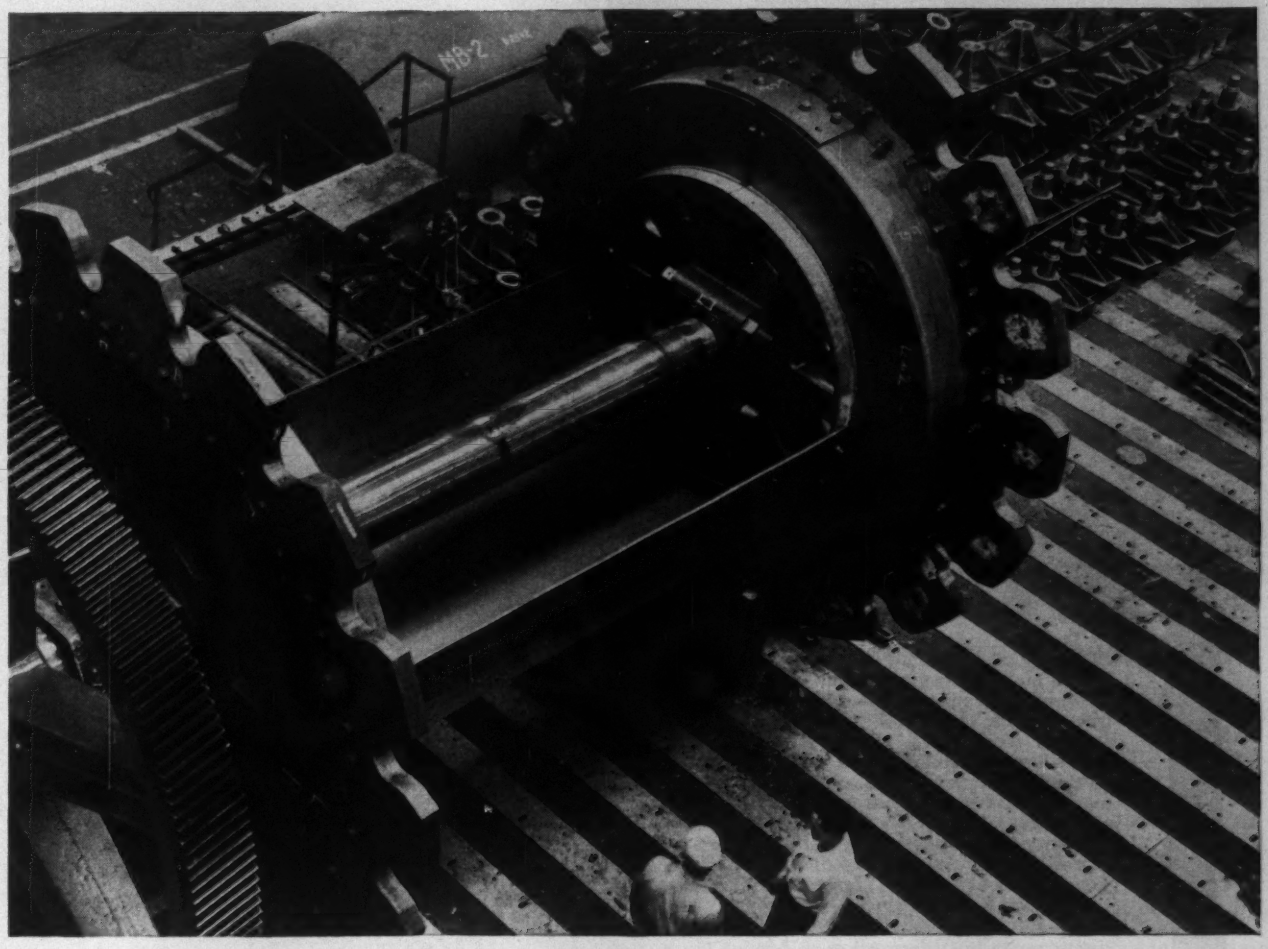
Full size mock-up of duct work for a sinter cooler in Dravo's mold loft. This model will provide templates for actual fabrication.

Dravo machinist operates 26-foot bed planer which is machining a full set of sprocket teeth. This method gives rigid control of uniformity for a perfect fit.



Pre-assembly of main drive for world's largest sinter machine in Dravo's Neville Island shops. All dimensions are carefully checked in this operation. Note partially assembled torque tube, a design feature which maintains accurate sprocket tooth alignment.

HOW DRAVO BUILDS SINTER MACHINES



Research and design begin the process. At Dravo's Research Center, sintering characteristics of ores to be used are determined . . . these form the basis for the final design. Through an exclusive licensing agreement with the Lurgi Company, Dravo incorporates sinter machine features developed by Lurgi modified to suit American standards.

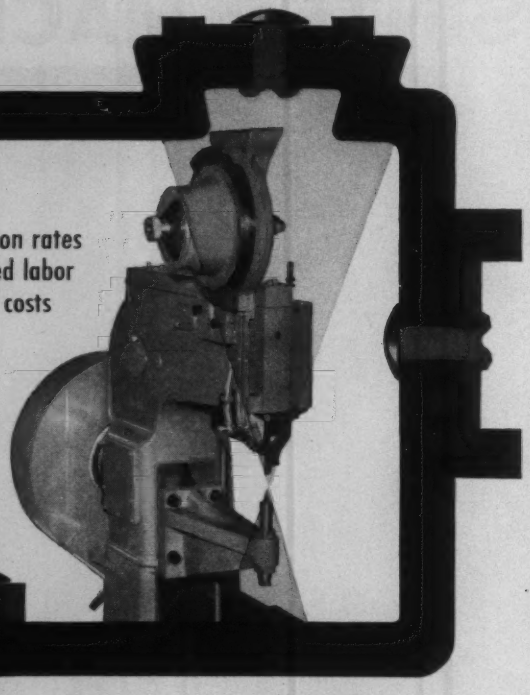
Next comes fabrication of the machine itself, precision built in Dravo's own shops. And, finally, the erection of the complete facility.

This kind of single responsibility, including research, fabrication and engineering-construction, produces sinter plants that perform to specifications—on time. For complete information, write or phone Dravo Corporation, Pittsburgh 22, Pennsylvania.

DRAVO
CORPORATION

Odd shapes are no problem for the new Townsend Model 75 Tubular Rivet Setting Machine

High production rates using unskilled labor cut fastening costs



Skillfully designed tooling gives complete versatility to the new Townsend Model 75 Tubular Rivet Setting Machine. A variety of specialized tooling is available to equip the Townsend machines for any size and shape of work.

Townsend tubular rivets are available in steel, aluminum, copper, brass, nickel-silver and special materials for use in joining anything from cloth to steel sheets. Thus, Townsend makes available the economies of tubular rivet fastening for a wide range of products in a number of different materials. Townsend's experienced fastening engineers provide application design service.

To enjoy the economies of fastening with tubular rivets, write for information on Model 75 Setting Machine and complete line of Townsend tubular rivets. Townsend Company, Engineered Fasteners Division, P.O. Box 71-B, Ellwood City, Pa.

Townsend Company

Engineered Fasteners Division

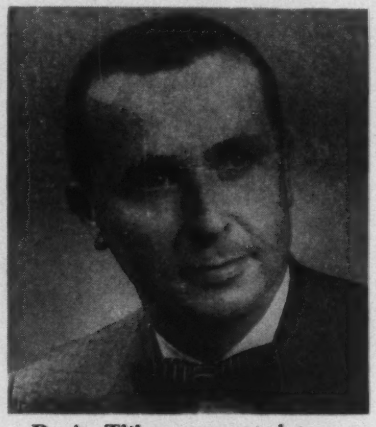
ELLWOOD CITY • PENNSYLVANIA

In Canada: Parmenter & Bulloch Manufacturing Company, Limited, Gananoque, Ontario

(Continued from P. 84)

electronic alloys sales, Reading, Pa., headquarters.

R. P. Hendrichs, promoted to plant manager, Jones Mills, Ark., fabricast plant, Central Foundry Div., General Motors Corp.



R. A. Titlow, promoted to general superintendent, Bedford, Ind., fabricast plant, Central Foundry Div., General Motors Corp.

Firth Sterling, Inc.—**G. A. Wilson,** appointed director, purchases and special projects.

Aluminum Co. of America—**R. A. Rohn,** appointed product manager, wire, rod and bar sales.

OBITUARIES

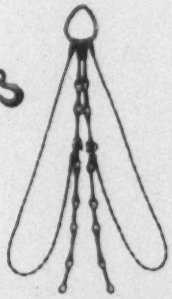
Dr. H. K. Ihrig, 62, vice president, research, Allis-Chalmers Manufacturing Co.

C. L. Foster, 56, vice president, international sales, The Austin Co.

L. F. Ravey, 62, asst. director, purchases, The National Supply Co., Pittsburgh.

HERE ARE JUST A FEW YELLOW STRAND BRAIDED SAFETY SLINGS DESIGNED SPECIFICALLY FOR MATERIALS HANDLING:

Four leg braided safety slings. (Single, 2 or 3 legs available.)



Adjustable slings for crate handling.

The ever popular MS-1 with sliding choker hook.

Yellow Strand Braided Safety Slings are available in practically any length and number of parts with scores of different fittings.

Handle any size, shape, weight of lift with maximum safety and ease

Highly machined parts, any size, weight or shape – massive castings and assemblies weighing hundreds of tons: you name your materials handling problem – your Broderick & Bascom Sling Specialist has the answer. Yellow Strand Braided Safety Slings!

These are extremely flexible slings with the strength of Yellow Strand and flexibility comparable to manila rope. For special requirements they are available with high strength "POWERSTEEL."

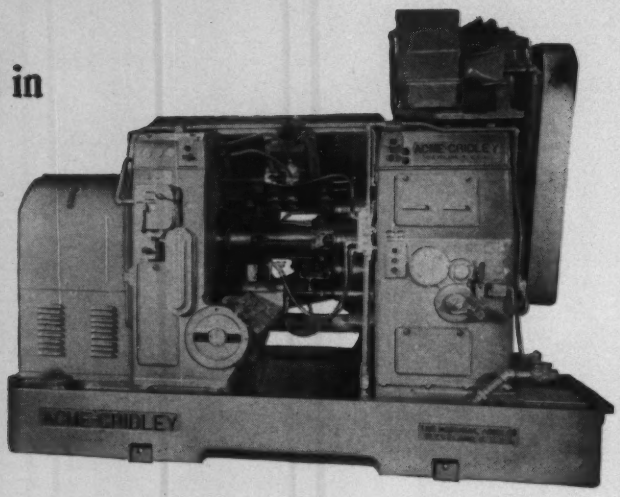
Most important, Yellow Strand Braided Safety Slings can be economically designed for your specific application by B & B Sling Specialists, and built by skilled master craftsmen.

For an analysis of your needs – for an extra margin of confidence, call our nearest branch, or our Engineering Department. *Broderick & Bascom Rope Co., 4203 Union Boulevard, St. Louis 15, Mo.*

Yellow Strand®

BRAIDED SAFETY SLINGS

Major breakthrough in shaft production . . .



Acme-Gridley multiple-spindle shaft machine equals output of four automated lathes

At Chrysler Corporation's Trenton, Michigan, Engine Plant, a remarkable new National Acme shaft turning machine has slashed camshaft production costs; is hailed as a major production development for the entire industry. Performing complete shaft journal machining in a single set-up, this rugged 6-spindle automatic provides substantial savings in floor space and capital outlay, reduces scrap loss and enables closer control of machining operations.

Key to this dramatic pay-off are imaginative National Acme solutions to the difficult problems of centering, driving, and stabilizing the long, flexible shaft during turning operations. An ingenious part-holding technique exposes bearing journals for turning—an impossibility in a chucking set-up.

Extreme capability is stressed in the design of the Universal Multiple-Spindle Shaft Turning Machine and permits the maximum number of machining operations to be performed on straight or flanged shafts held between centers.

The shaft turning machine is additional evidence of National Acme know-how applied to the solution of special machining problems. This same insight and ability is available to any manufacturer interested in reduced costs and increased production. Our representative is as close as your telephone.

National Acme's "Zone of Responsibility" includes all phases of cost reduction. Check YOURS . . . Then Check National Acme

Direct Costs: these include direct dollar savings as realized by Chrysler Corporation . . . an "everyday" job for Acme-Gridleys. **Indirect Costs:** effecting important savings in maintenance, downtime, scrap reduction, tool costs, etc. **Product Redesign:** teaming with your design group to take full advantage of Acme-Gridleys' cost reducing capabilities. **Direct Material Costs:** our engineers provide important savings in this area by constantly matching machines and tools to modern metallurgical problems. **Make-or-Buy Reviews:** in many cases our Contract Division can assume your production headaches and relieve you of immediate capital investment. **Spot Modernization:** pioneering in modern tooling methods, and the flexibility of Acme-Gridleys can provide many "on-the-spot" savings.

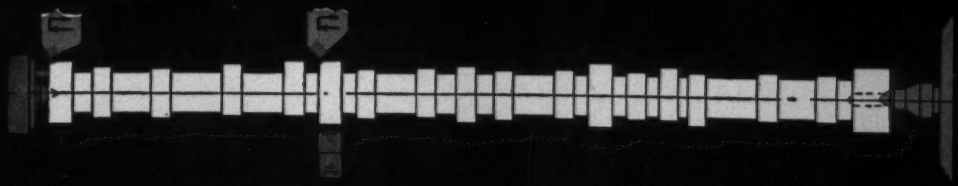
National Acme

The National Acme Company
175 E. 131st Street
Cleveland 8, Ohio

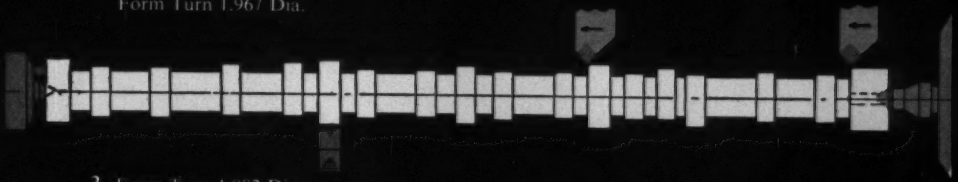
MMT-PE

Sales Offices: Newark 2, N.J.; Chicago 6, Ill.; Detroit 27, Mich.

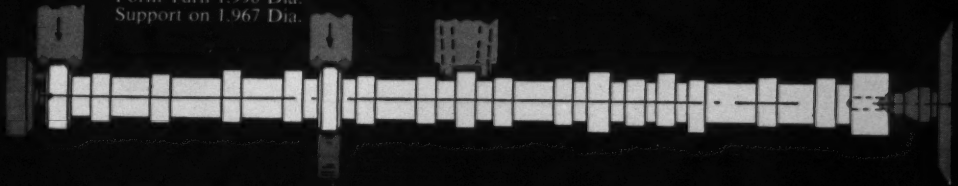
1st position—load and unload



2. Form Turn 1.951 Dia.
Form Turn 1.967 Dia.

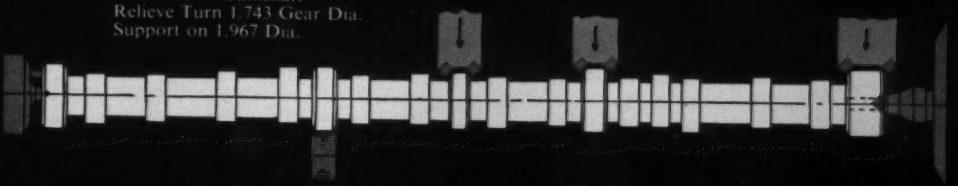


3. Form Turn 1.982 Dia.
Form Turn 1.998 Dia.
Support on 1.967 Dia.



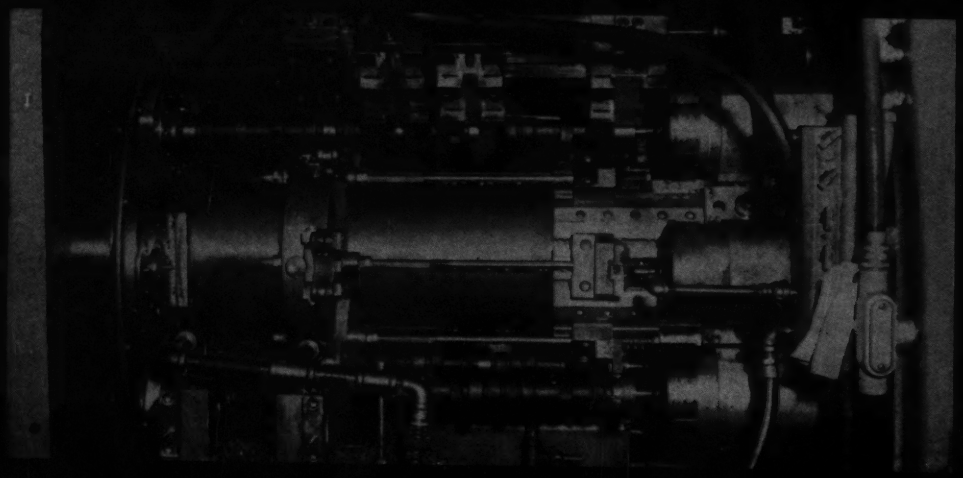
4. Chamfer O.D. of 1.951 Dia.
Chamfer O.D. of 1.967 Dia.
Face Sides of 1.743 Dia.
Support on 1.967 Dia.

5. Face End of Camshaft
Relieve Turn 1.743 Gear Dia.
Support on 1.967 Dia.



6. Chamfer O.D. of 1.743 Dia.
Chamfer O.D. of 1.982 Dia.
Chamfer O.D. of 1.998 Dia.
Support on 1.967 Dia.

High-test cast iron camshaft with journal machining completed . . . 13 operations in 22 seconds.



Close-up of tooling zone. Open spindle in load and unload position shows unique centering, holding and driving mechanism.

if HEAT is YOUR PROBLEM call Rolled Alloys for

RA 309

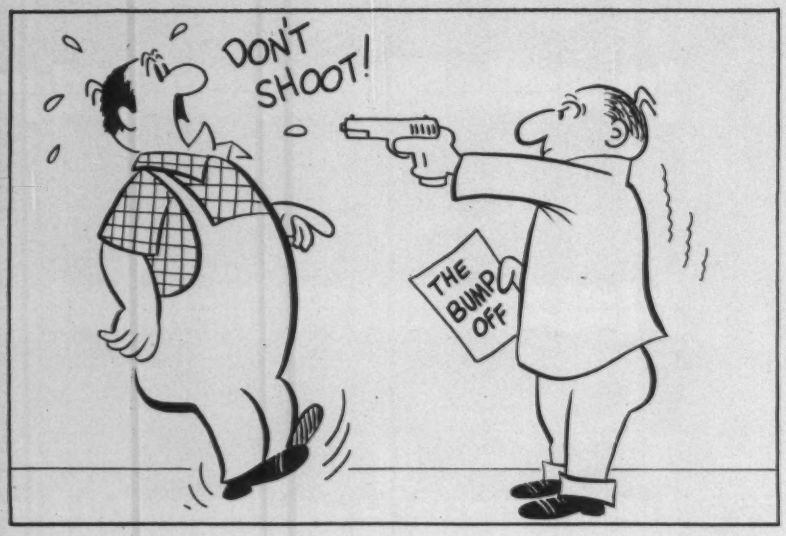
RA 310

RA 330

IN STOCK—
IMMEDIATE DELIVERY
Send for Stock List or Literature

Rolled Alloys, Inc.
Heat and Corrosion Resistant Alloy Specialists

5307 Concord Avenue • Detroit 11, Michigan
333 William Street • South River, New Jersey



You Arbitrate It!

From the files of
The American Arbitration Association

The Bump-Off

■ After much study, management of a kitchen-appliance manufacturing company decided to demote a foreman back into a production job, in a department from which he had once been promoted. Estimating that the man had nine years' service credit, the personnel manager "bumped" a shear operator with less seniority off the job and gave it to the ex-foreman.

"You Arbitrate It!" appears in the second issue of The IRON AGE each month. Look for it in the October 13 issue.

At this point the union objected. "The foreman can use his seniority only to get into a vacant job if no laid-off man wants it," argued the shop steward. "He can't bump a man off a job."

A Ruling Clause—During grievance procedures, both sides agreed that the issue hinged on interpretation of this clause: "The union agrees to the return of supervisory employees to the bargaining unit, provided that at the time of promotion they worked on a job in the bargaining unit. Seniority credit of such employees will include the period the employee spent as a supervisor. The employee will be returned to a job, if any, in the bargaining unit to which his seniority entitles him."

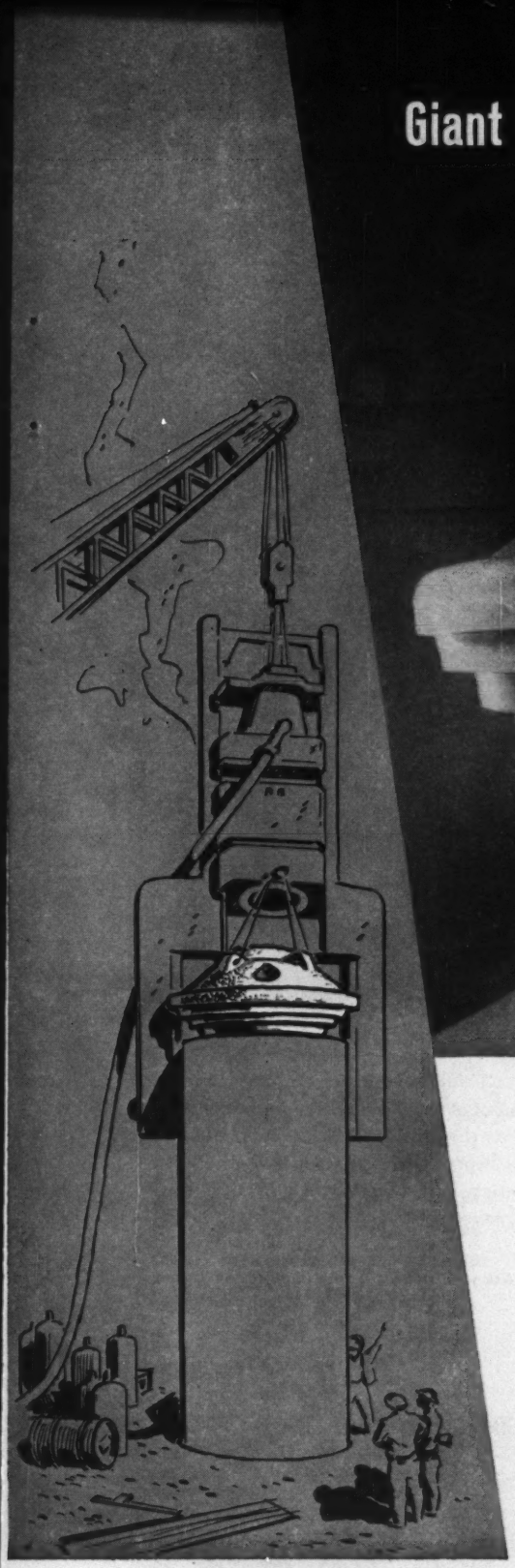
Finally, the parties selected an arbitrator from the panels of the American Arbitration Assn. to resolve the dispute. How would you rule?

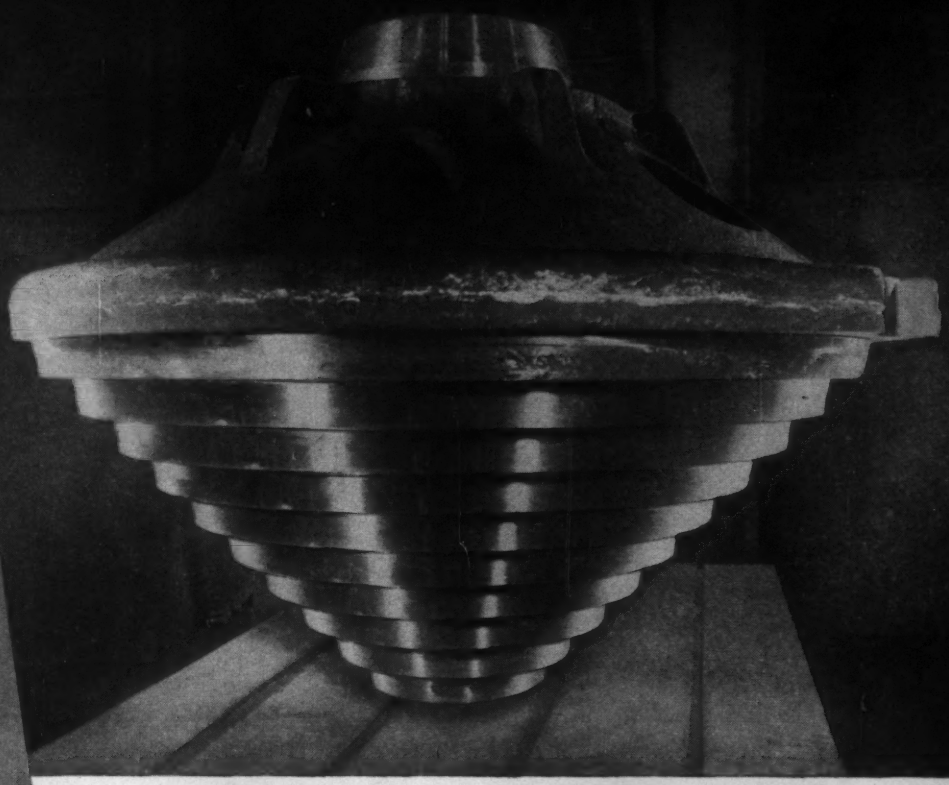
The Arbitrator Ruled:

He said that if the union's view was upheld, a foreman could have only a vacant job that nobody else claimed. However, for this, he wouldn't need any seniority. From the fact that the parties provided for accumulation of seniority, the arbitrator inferred that they intended the foreman to be permitted to use length of service for bumping purposes. This, he said, was the only way to interpret the clause, giving meaning to every sentence.

CAUTION: The award in this case is not necessarily an indication of how arbitrators might rule in apparently similar disputes. Each case is decided on the basis of the particular history, contract, testimony and other facts involved. Some of these essential details may have been omitted in condensing the original arbitration for brief presentation.

Giant Cast Steel "Top" For An Oil Explorer





If this 17,540 pound cast steel pipe cap were not used to set a string of oil well casing, it could be mistaken for a gigantic spinning top. Either way, here is visual proof of the diverse requirements for industrial steel castings which are satisfied by the experienced engineers, metallurgists and skilled foundrymen of Erie Forge & Steel Corporation. From the open hearth melt through the machining operation to the shipping dock, close quality control is our prime concern.

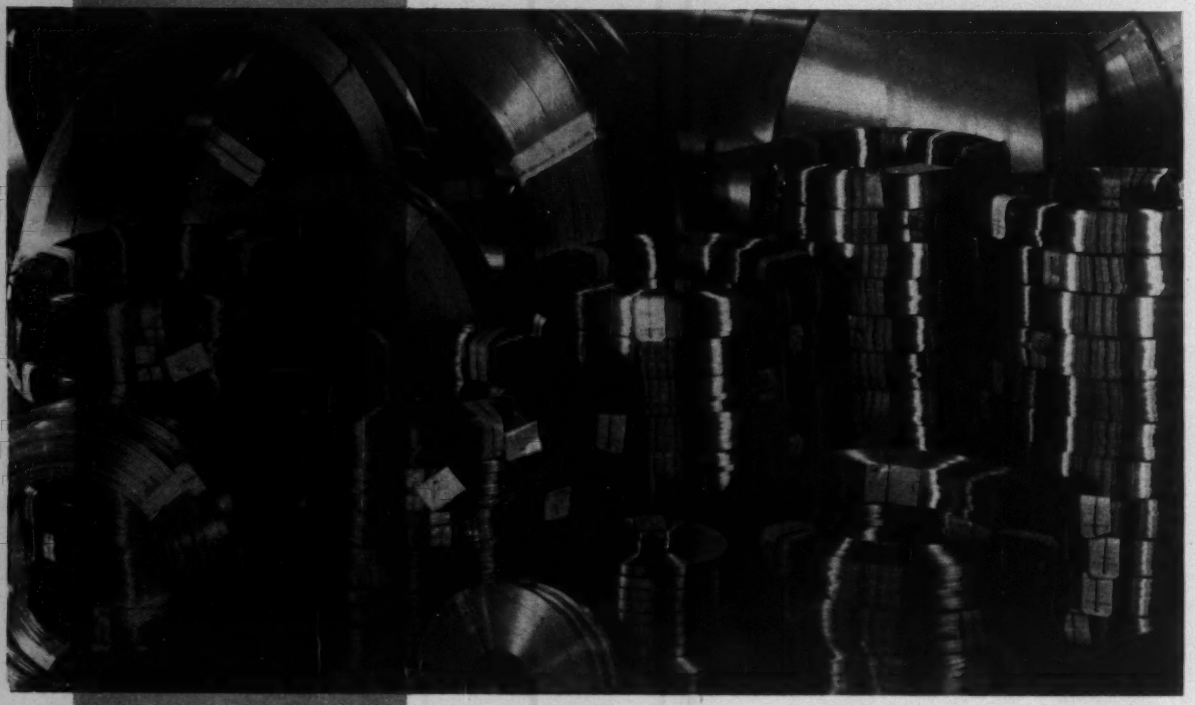
Erie Forge & Steel for many years has been making Steel Castings for rolling mills, cement mills, blast furnaces, presses, forging hammers, power turbines, ships, oil field production equipment and heavy industrial machines.

You can depend upon us to meet your most severe steel casting and forging requirements.

ERIE FORGE & STEEL CORPORATION

ERIE, PENNSYLVANIA

15 Proofs of SANDVIK SPRING STEEL QUALITY

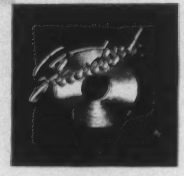


For up to 40 years Sandvik Specialty Steels have been used successfully for —

1. Compressor Valves
2. Band Saws
3. Piston Ring Springs
4. Conveyor Belts
5. Doctor Blades
6. Feeler Gauges
7. Clock & Watch Springs
8. Vibrator Reeds
9. Shock Absorbers
10. Razor Blades
11. Surgical and Special Knives
12. A wide variety of Springs
13. Textile Machinery Sinkers, Needles, etc.
14. Camera Shutters
15. Masons Trowels

This list of exacting applications is the strongest proof of Sandvik steel's consistent quality. Over the years, these users have found that when product performance depends on *specific physical properties, high fatigue life, accurate and uniform flatness, straightness, gauge, width and finish,* Sandvik quality is well worth its price.

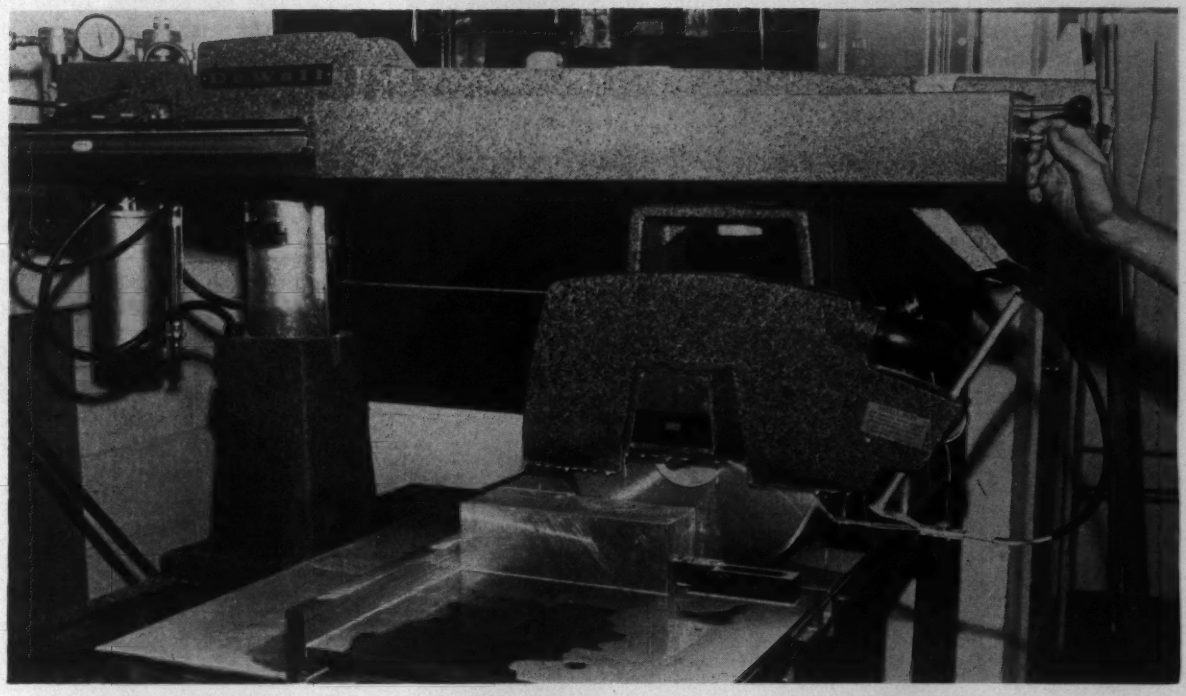
Ask your nearest Sandvik office for further information or technical assistance.



SANDVIK STEEL, INC.
1702 Nevins Road, Fair Lawn, N. J. SWarthmore 7-6200
N. Y. C. ALgonquin 5-2200

Branch Offices:
Cleveland • Detroit • Chicago • Los Angeles
SANDVIK CANADIAN LTD.
P. O. Drawer 1335, Sta. O. Montreal 9, P. Q.
Works: Sandviken, Sweden

SS-220



HIGH-SPEED CUTTING: Finish of cut aluminum section is fine enough to preclude follow-up machining.

Fast, Accurate Circular Saw Cuts Nonferrous Metals

If speed and surface finish are goals in your nonferrous cutting program, then take a good look at the circular saw.

It's economical, versatile and thoroughly field tested.

■ In the cutting of nonferrous metals, two production factors are paramount: Cutting speed and surface finish. Find the tool that can do both of these jobs well and you'll make a worthwhile contribution to your fabricating lines.

Such a tool does exist. It can cut thin-walled extrusions and solid sections up to 8 in. thick with equal ease. One mill uses this tool to cut through 8-in. diam aluminum ingots. It is done in one minute with a surface finish between 30 and 40 microinches.

Still another company can penetrate a 1 x 4¾ in. aluminum extrusion in seven seconds with a 10 to 20 microinch finish. Foamed, honeycomb and foil aluminum, as well as plastics, are being cut without any support. Fragile-walled sections and thin, unsupported ribs do not deform or collapse under such cuts.

Three Factors — The tool in question is a high-speed circular saw. Made by DeWalt, Inc., Lancaster, Pa., the saw relies on three main traits for its success. First, the system contains a hydraulically-controlled power cross feed. The second feature, a mist coolant system, is probably the most vital trait of the three. The last factor is the tungsten carbide tipped blade.

Just how important is the mist coolant? You won't get very far without it. The coolant is automatically fed right into the cutting operation, greatly reducing any heat that is generated. The mist not only imparts marginal lubricity to the sides of the teeth, it also protects the machine parts and the cutting tool from corrosion.

Heat within the chip-tool interface will get into the 1000° to 1200°F range if coolant is absent. However, presence of mist coolant

improves tool life 20 to 30 times. The mist coolant device is a full pressure system that dispenses mist only on the cutting stroke. Once the proper mixture of air and fluid has been determined, the mist is conveyed automatically straight to the nozzle tip.

Air Powered—The power cross-feed system contains an air-powered device which is hydraulically controlled on the cutting stroke. Through a metering valve, you can adjust the feed velocity anywhere from zero to 12 ips. The stroke length is adjustable, too. Its range is 0 through 34 in. The feed can be controlled either automatically or manually.

Of course, carbide-tipped blades are a "must" in this setup. There are three classes of blades from which to choose. One class takes care of aluminum up to 1-in. solid depth, to 1½ in. on copper and brass and ½ in. on lead and magnesium.

The second class moves into the heavier sections, while a third group (consisting of a single blade) is designed for hand or chain-fed machines.

Expansion Slots — The blades contain from four to six expansion slots. This gives room for the rim annulus to expand thermally during cutting. Without slots, the rim would tend to buckle.

In the triple-chip grind, alternate teeth are beveled. They're also a little higher than the square-ground teeth. The beveled tooth, therefore, removes most of the metal from the workpiece. The square tooth follows with a shaving action. As such, cutting efficiency is high and surface finish is excellent.

These three features are the chief reasons that the DeWalt saw can perform cut-off and finishing steps in one crack. The saw can also slot, slit and, when equipped with specially-designed cutters, it will even perform shaping jobs.

Field Reports—Actual production in the field underlines the saw's value. For example, Reynolds Metals Co. is getting surface finishes between 30 and 40 microinches on 2¼-in. thick Grade EC aluminum bus bars, 12 in. long. Cutting at a feed rate of an inch per second, the saw is slicing through 140 of these sections every hour.

Reynolds engineers point out that tolerances on these cuts is ±0.003 in. in thickness and ±0.004 in. in flatness. The carbide-tipped blade for this job measures 14 in. in diameter. The blade has 52 teeth and a 0.158-in. kerf. This is a straight 90° cut-off job that is transferred by hand, then clamped automatically.

Another production job at a major brass mill puts a 7½-hp Model HD 710M saw to work cutting 3¾-in. oblong sections of phos-copper anodes (alloy 103). Cutting at a feed rate of 0.2 ips, the saw makes

Cutting Rates Soar in Circular Sawing

WORKPIECE*		Feed Rate, ips	Time per Cut, seconds	Surface Finish, microinches	Tolerance of Cut
Material	Dimensions				
EC Aluminum	2.25 x 12 in.	1	14	30–40	Length, ± 0.003 in. Flat, ± 0.004 in.
Phosphor copper	1.875 x 3.75 in.	0.2	19	50–60	Length, ± 0.002 in. Flat, ± 0.003 in.
Vinyl plastic	2 x 9 in.	6	1.8	20–30	Angle, ± 6 sec Straightness, 0.001 in. in 9 in.
Aluminum ingot	8 in. diam	0.19	60	30–40	Length, ± 0.002 in.
Copper nickel	1.812 in. OD x 1.312 in. ID	0.5	5	40–50	Not critical
6061-T6 Aluminum	1.5 x 48 in.	1	50	Not critical	Not critical
Aluminum foil in coils	4.5 in. OD x 2.75 in. ID	0.75	8.5	20–30	Length, ± 0.002 in. Flat, ± 0.002 in.
6061-T6 Aluminum	1.75 x 2.75 in.	0.75	5.7	25–30	Length, ± 0.0005 in. Flat, ± 0.001 in.
6063 Aluminum	4.5 in. diam	0.37	17.5	30–40	Length, ± 0.002 in. Flat, ± 0.001 in.
Aluminum	4.5 x 6.75 in.	0.25	48	40–50	Not critical
Copper tubing	0.937 x 1.75 x 0.062 in. wall	1	2.3	25–35	Length, ± 0.0005 in. Flat, ± 0.001 in.
Soft copper pig	1 x 4 in.	0.56	8.4	35–45	Not critical
EC Aluminum	1.5 x 12 in.	1.25	10.4	30–40	Not critical
Plexiglas	2 x 4 in.	0.75	7.65	5–10	Flat, ± 0.0005 in.
Bakelite	1 x 2 in.	0.75	3.5	10–20	Length, ± 0.001 in. Flat, ± 0.0005 in.
6061-T6 Aluminum extrusion	1 x 4.75 in.	0.75	7	10–20	Length, ± 0.0005 in. Flat, ± 0.001 in.

* In each instance, 90° cut-off was used.

120 cuts per hour. Here, the blade has 70 teeth and a 0.138-in. kerf. It is 12 in. in diameter.

Expert Advice — According to O. H. Nuss, Research Engineer at the DeWalt, Inc. facility, proper cutting conditions must be maintained. Otherwise, the user will not get the utmost from the circular saw. To establish the right conditions, you must select the right machine, blade, cutting position, feed rate and coolant.

The true effectiveness of the saw system is revealed by a test run at the DeWalt plant. The workpiece in this instance is an aluminum extrusion, 6061-T6, that measures 1 x 4¾-in. This material has been cut over 3000 times. The same blade has made every cut and it has not shown any signs of dulling.

On this job, a 7½-hp machine is used that operates at 3425 rpm. The 12-in. diam blade is carbide tipped with 70 teeth.

Wide Choice — DeWalt makes eight models of machines. Within these eight models are many size combinations of motors and arms to accommodate a wide range of nonferrous materials.

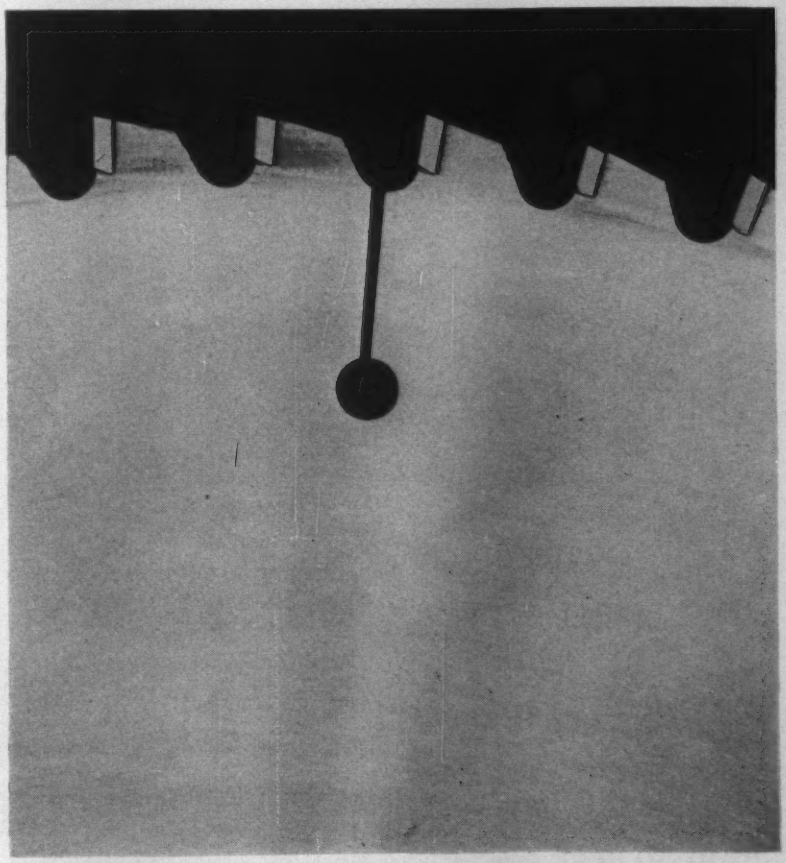
Several models — the GE, HD and TC series in particular—are not just metal-cutting saws. They are, in fact, high-speed, precision metal-cutting units. They are machine tools of the first order.

For Support — An aluminum table top provides a firm surface for supporting and clamping the workpiece. It's equipped with a chip slot and an ejector chute. The chute will deposit about 95 pct of the cuttings behind the machine.

The table top is designed in such a manner so that the blade can extend below the bottom of the workpiece by as much as 1¾-in.

Other pieces of auxiliary equipment are available. They include roller conveyor extensions to support and handle long pieces of work; air clamps to secure the work; indexing stops for work positioning.

CHECKING THE FINISH: DeWalt's O. H. Nuss knows that proper cutting conditions must be established for the saw to function at its best.



BLADE DESIGN: Carbide-tipped blades come in 12, 14 and 16 in. diam. Triple-chip tooth grind and expansion slot add to blade efficiency.

Ceramic Platens Help Shape Stainless Honeycombs

A new tooling process turns out stainless steel honeycomb panels up to 7 by 28 ft.

The entire brazing, conditioning and aging cycle is handled in a single, low-cost tool.

■ An economical process forms large, high-strength, stainless steel honeycomb panels. The new process, developed by the Avco Corp.'s Nashville Div., Nashville, Tenn., makes it possible to braze stainless steel honyecomb in almost any size or shape.

Known as Avcoramic tooling, the new production process currently turns out honeycomb panels that measure up to 7 by 28 ft. Uses for these panels include structural parts for space vehicles, missiles, supersonic aircraft and large radar reflectors.

Simple Setup — Commenting on the new process, John Mihalic, president of the Nashville Div., states: "The new process will make possible substantial savings in producing stainless steel honeycomb panels."

To explain the process, Mr. Mihalic says, "We first make brazing platens out of ceramic material. These platens can be any size and almost any shape. Holes are put through the ceramic for both heating elements and for cooling purposes."

Surfaces of the ceramic are finished to close tolerances. These surfaces serve as contour forms for brazing the stainless steel honeycomb. After cleaning the forms, stainless steel sandwich materials are enclosed in a steel envelope and placed between the matched ceramic platens.

Tight Contact—To insure close contact for the parts being brazed, a vacuum is maintained in the envelope. Then external pressure is applied to the ceramic platens.

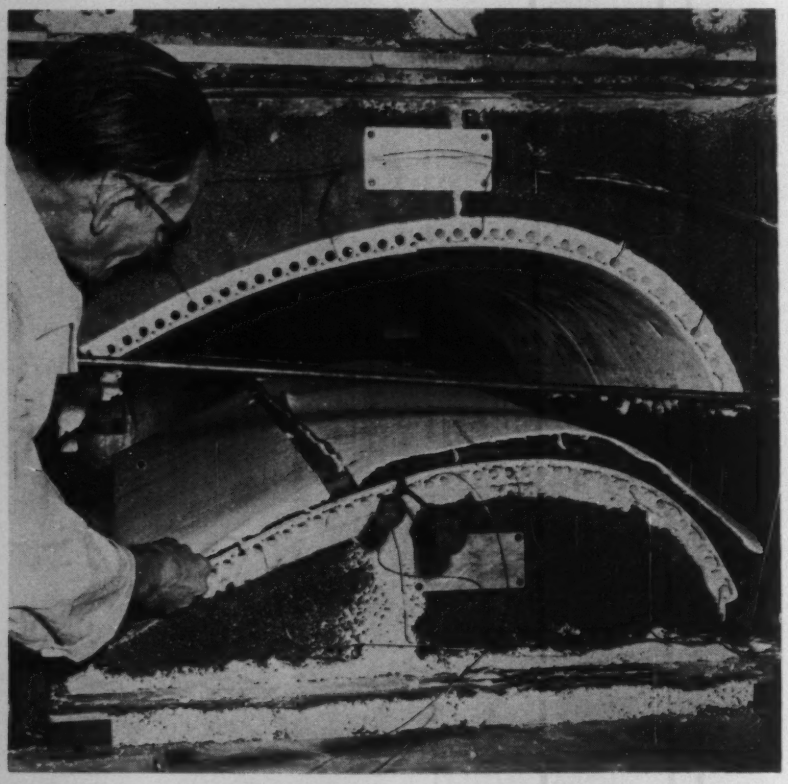
Electric heating elements bring the ceramic material to the proper brazing temperature. The correct heat is held for a short (controlled) time period.

Next, the ceramic platens and the stainless steel honeycomb sandwich are cooled very quickly. Air is forced through the holes in the ceramic to speed the cooling cycle. Even sub-zero temperatures are possible while the honeycomb assembly is still in the Avcoramic tool.

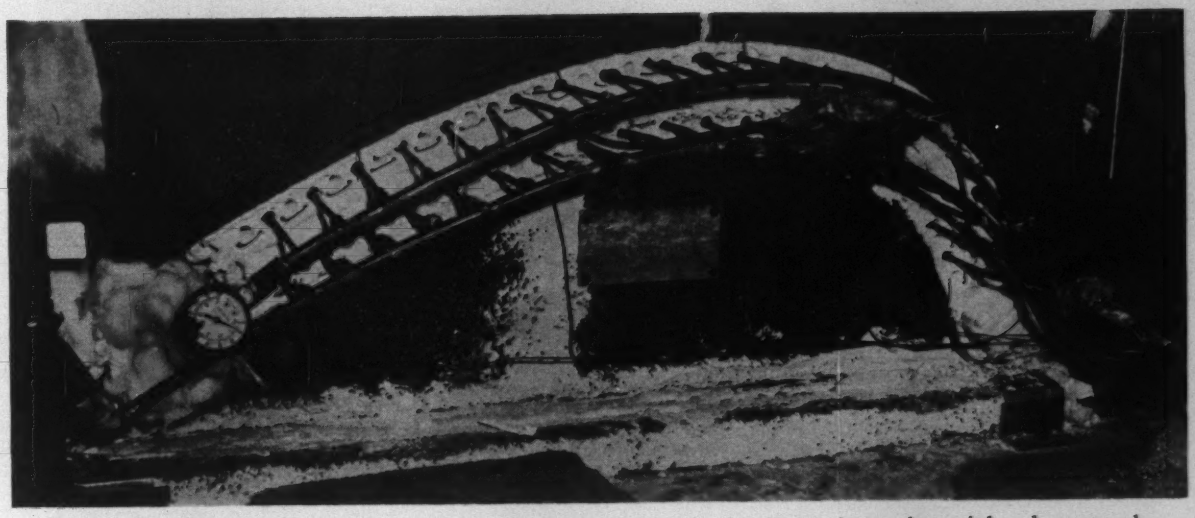
Finally, to obtain maximum strength, the panels are electrically aged by reheating through the platens. Total production - cycle time is 14 hours.

Light and Strong—The finished panels are so light they float on water. However, despite their light weight, the honeycomb panels withstand the rigors of supersonic flight.

Mr. Mihalic says that the key to the new process is a ceramic material that was developed by Avco. This high-strength ceramic can be cast to tolerances of 0.003 in. And it withstands thermal shock. Yet,



READY TO HEAT: Core and outer panels are arranged in a sandwich, then the operator places the assembly between ceramic platens. The platens contain holes for heating elements. These holes also speed air cooling.



RAPID BRAZE: Electric heating elements, inserted in the ceramic platens, braze the stainless honeycomb.

with little effort, it can be worked into any desired shape.

Early work on the new ceramic was done at Avco's Research and Advanced Development Div., Wilmington, Mass. Follow-up action on its use with brazed honeycomb was handled at Nashville.

The Nashville Div. produces sections of the aft fuselage and some bulkheads for North American Aviation's B-70 Valkyrie bomber. It's expected that this new bomber will fly at three times the speed of sound.

Critical Use — Stainless steel honeycomb, being lightweight, heat resistant and having a high strength-to-weight ratio, serves in the fuselage and the wings of the huge bomber. A prototype of this new aircraft is now under construction.

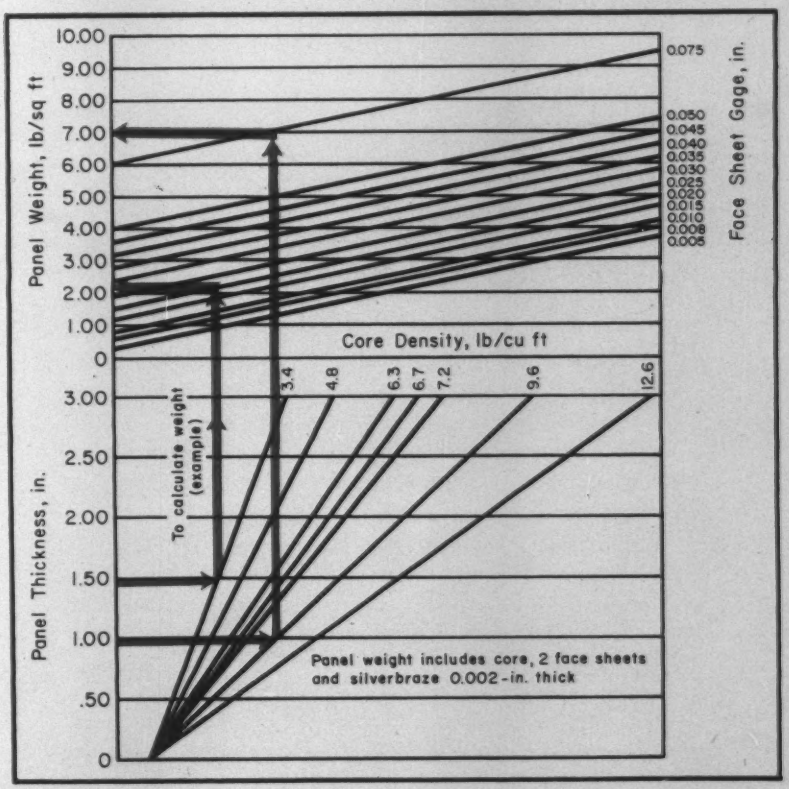
Avco's contract with North American Aviation for the production of stainless steel honeycomb panels extends over the next few months. Avco is also studying other uses for the Avcoramic process.

Wide Potential — "There are a great many uses for lightweight stainless steel structures yet to be explored," Mr. Mihalic declares. "By accomplishing the entire brazing, conditioning and aging cycle in a single, low-cost tool, the Avcoramic process makes it possible to produce such structures at much lower costs," he also adds.

This, in turn, will extend the use of stainless steel honeycomb to many new fields.

Production of stainless steel honeycomb has been underway at the Nashville Div. for the past two years. Both the Avcoramic process and other standard brazing methods are used. One large brazing furnace turns out honeycomb panels up to 7 by 28 ft. Two smaller furnaces handle panels up to 2½ by 5 ft.

Check Honeycomb Weight



Computer Service Aids Industry

Computer-assisted programming reduces production costs. However, it often proves too expensive for small companies.

There's a way around this bottleneck. A major manufacturer offers tape-control service.

■ A new computer center specializes in numerical-control service. It offers technical aid to all business and manufacturing concerns—regardless of their size.

By using electronic computers, the Wichita Div. of Boeing Airplane Co., Wichita, Kan., has developed an efficient approach that promises to reduce overall production costs.

Diverse Experience—Boeing reports good results from numerical-control and computer-assisted programming. With wide experience, the company concludes that tape-commanded machine tools can improve all general-production methods.

This conclusion is based on tabulated results. With years of production experience, Boeing-Wichita has specialized in numerical control while making missile bombers such as the B-52.

Recently the company decided that its knowledge in the numerical-control field should be offered to others as a commercial service. Boeing had previously received many requests for guidance and advice. Services of the company's programmers are in great demand.

Since Boeing wants to diversify its activities, the service requests presented a chance to enter a new field. Boeing-Wichita's experience is tailored to a national and international trend in fabrication methods.

Expert Service—Thus a service organization, Boeing Applied Computing Services (BACS) was born. R. C. Wilburn, a long-time Boeing veteran with experience in key manufacturing posts, is the manager. BACS has a team of specialists who have been through the entire numerical-control period of growth and expansion at the Kansas plant.

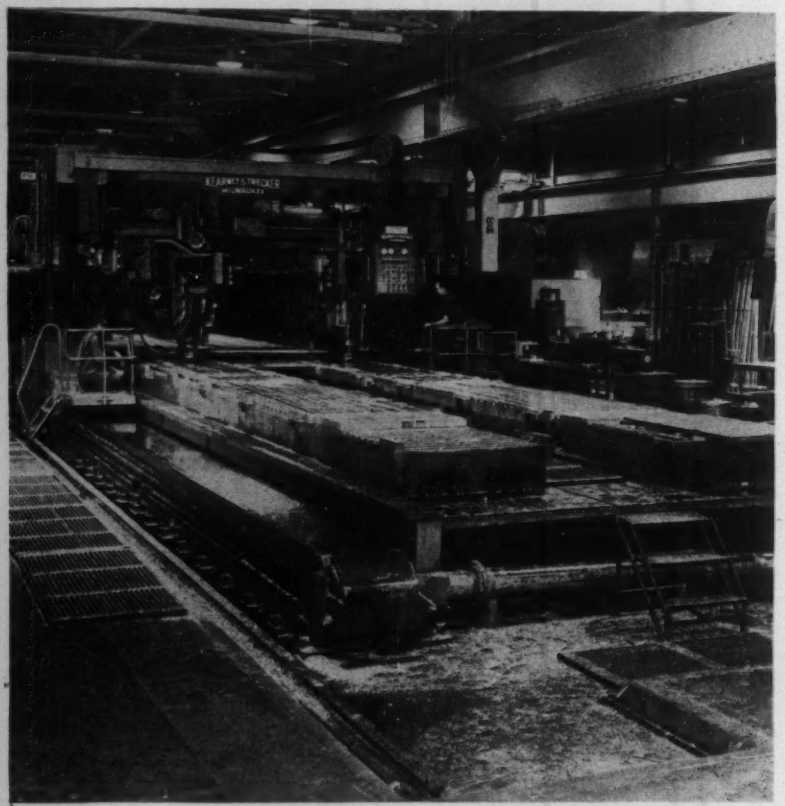
Mr. Wilburn states: "This field is relatively new . . . we have achieved a high degree of proficiency which enables us to offer unique services which are of benefit to large and small companies alike."

Available services cover many phases of numerical control. The new center's main services include: machine programming of parts, tools, dies and templates; along with all the steps in the preparation and verification of tapes for machine tools.

Here's an example of how BACS functions. A leading manufacturer of electrical parts needed help in making a "hog-out" part in order to meet tight production schedules.

Short Lead Time—BACS personnel studied prints of the part. They decided it could be made on a numerically-controlled profile mill. Within five days the part was programmed; the data were processed by a computer; tapes were made; and sample parts were returned to the company for inspection. The client found the job acceptable, so the balance of the order was completed.

The new computer center has a total of 21 numerically-controlled



TAPE CONTROLS MILL: Magnetic tapes control all functions of a large horizontal skin mill. Principal use for this heavy-duty equipment is contour milling on a missile bomber's lower wing skin panels.

machines. These include: profile mills, skin mills, lathes, jig borers and even automatic riveters. Control systems for these machines are varied. This variety calls for a complete tape-processing center.

To process tapes the center uses several computers, card-to-card conversion machines, tape-storage areas, programming areas, and other tape-preparation and verification equipment.

Check Tapes—Two company-designed devices verify tapes. One of these devices consists of a series of electronic instruments. These instruments check magnetic tapes.

An oscilloscope—with audio signals—scans 14 tape channels at the same time. Problems such as signal "drop out" or weak signals are pinpointed by initial checking.

The second device is a plotter-verifier unit. It converts tape codes into part drawings. This unit can completely verify a control tape prior to its release. This precludes the need for costly test runs.

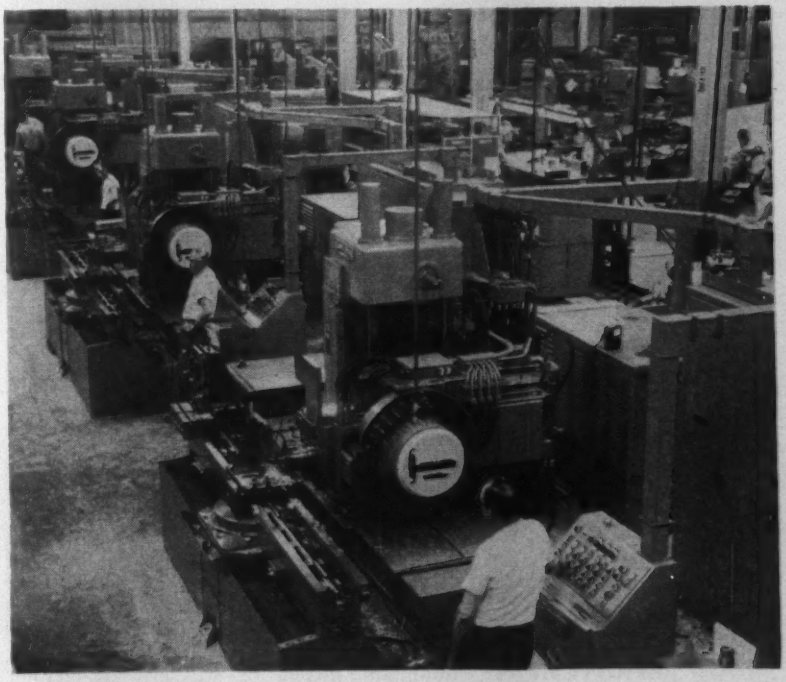
Wide Field—As more and more companies show an interest in tape controls, they move into a rapidly expanding field. Some companies may not want to plunge completely into this costly field. They may view only certain phases as useful to their operations.

Among other services, BACS offers a way to make an intelligent and economical start in the numerical-control field. For those who wish to keep their initial investments low, BACS can perform any part of the process.

Many companies want dies or actual parts made in a hurry. In some cases these dies and parts are quite complex. As a result, long lead times are common. Boeing's new center can deliver on this score.

Savings can also be realized. In many cases, time is money. Since BACS has the equipment and the know-how for an immediate programming solution, it's often cheaper and faster to call on this organization of numerical-control experts.

ELIMINATE TAPE ERRORS: A plotter-verifier converts tape codes into part drawings. This replaces "tooling up" for expensive test runs.



EFFICIENT OPERATION: Tapes provide centralized control. With a wide range of speeds, these machines mill, drill, ream, tap and face.

Magnetic Stirring: A New Way To Refine Metal Structure

By **F. A. Crossley**—Senior Metallurgist, Armour Research Foundation of Illinois Institute of Technology, Chicago

Arc-melted metals are hard to fabricate in the as-cast state. The culprit: a coarse grain structure.

What happens when the metal is magnetically stirred during melting?

■ It's difficult to control grain structure in ingots produced by the cold-mold, consumable-electrode arc-melting process. The main reason: the high thermal gradient under which the metal freezes.

Almost all metals produced commercially by this process are reactive. They are readily contaminated by impurities such as hydrogen, nitrogen, oxygen, and carbon. Also, ingots of these metals have coarse, columnar grain structures. Result: fabricability and mechanical properties suffer.

It's known that fabricability improves after a fine-grained structure has been developed by working. Perhaps, the properties of these metals in the as-cast state could be equally improved if fine grained structures could be achieved.

Puts Field Around Mold—Magnetic stirring has been used for some years to improve the consumable-arc-melting process. It is usually effected by passing a direct current through a coil surrounding the mold. This produces a magnetic field.

Interaction of the electrode current with this field produces a force which stirs the liquid metal in the mold.

Some of the benefits of this standard technique are: increased melting efficiency; improved ingot structure. However, the improvement in ingot structure is not that great to be called grain refinement.

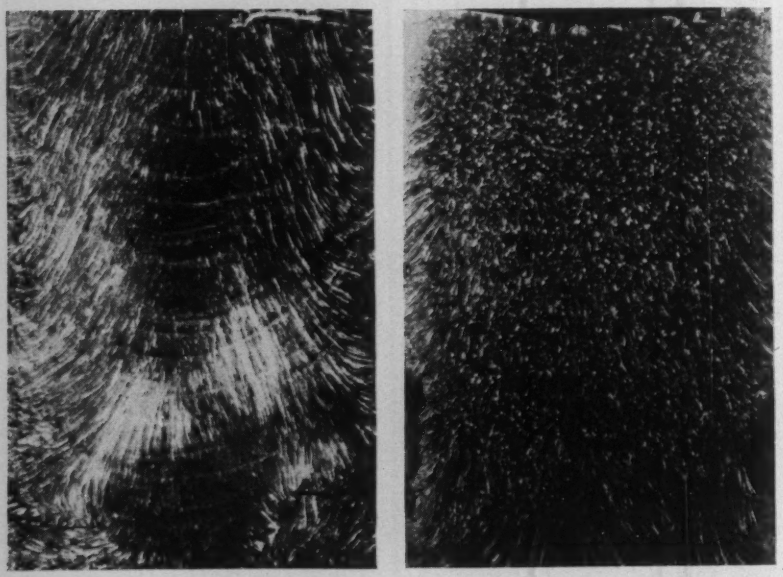
Study New Techniques—Recent experiments at the Armour Research Foundation dealt with means for making fine, equiaxed grain structure in consumable-arc-melted ingots.

Four techniques were studied: Magnetic stirring at much higher field strengths than are normally used; alternating coil polarity (ACP); deep pool, negative pulse melting; and positive pulse melting.

ACP magnetic stirring consists of periodically reversing the polarity of the dc imput to the magnetic stirring coil. The deep pool, negative pulse technique consists of melting at a rate—enough to maintain a deep pool, and with a periodic cut in current. Positive pulse melting is a periodic increase of the electrode current.

The materials studied were aluminum and nickel. The former, of low melting point and high thermal conductivity, is fairly easy to grain refine; the latter, of high melting point and low thermal conductivity, is fairly hard to grain refine. Electrodes of these metals were melted into ingots 3 in. diam x 4 or 6 in. long.

What Are Findings?—A study of ingot macrosections points up the effects of magnetic stirring. Positive pulse melting produced no beneficial effect. Negative pulse melting im-



SHOWS IMPROVEMENT: Aluminum, melted by standard arc-melting process (left), has course, columnar grains. Using the deep pool, negative pulse technique improves grain structure somewhat (right).

proved the structure somewhat as did magnetic stirring at 5000 amp-turns.

Attempts to produce finer grain size in aluminum ingots by raising the melting current from 600 to 1200 amp while maintaining a 2000 or 5000 amp-turns magnetic field were unsuccessful. The arc was unstable. Unsound ingots resulted. Also, grain size was not further reduced.

The photographs point out that the most successful technique for aluminum was ACP magnetic stirrings. Settings were 11,000 amp-turns and 0.5 cps. When applied to nickel, ACP magnetic stirring also gives good results.

Other Applications?—How about arc welding? Will this technique of magnetic stirring work in this field?

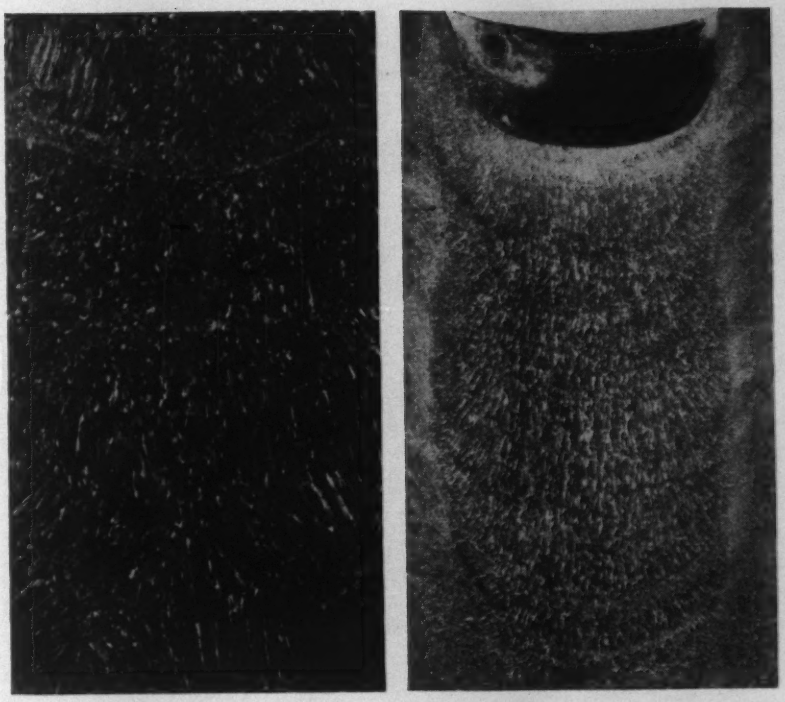
A number of experiments were conducted using two coils of 1000 turns each. The coils were mounted, one around the welding torch and the other just below the workpiece. This arrangement gives a vertical field through the workpiece.

Both magnetic stirring and ACP magnetic stirring were applied in welding three metals: Type 302 stainless steel, commercial purity titanium and Ti-6A1-4V alloy. Thickness of material was 0.093 or 0.100 in. All welding was by tungsten electrode under inert gas.

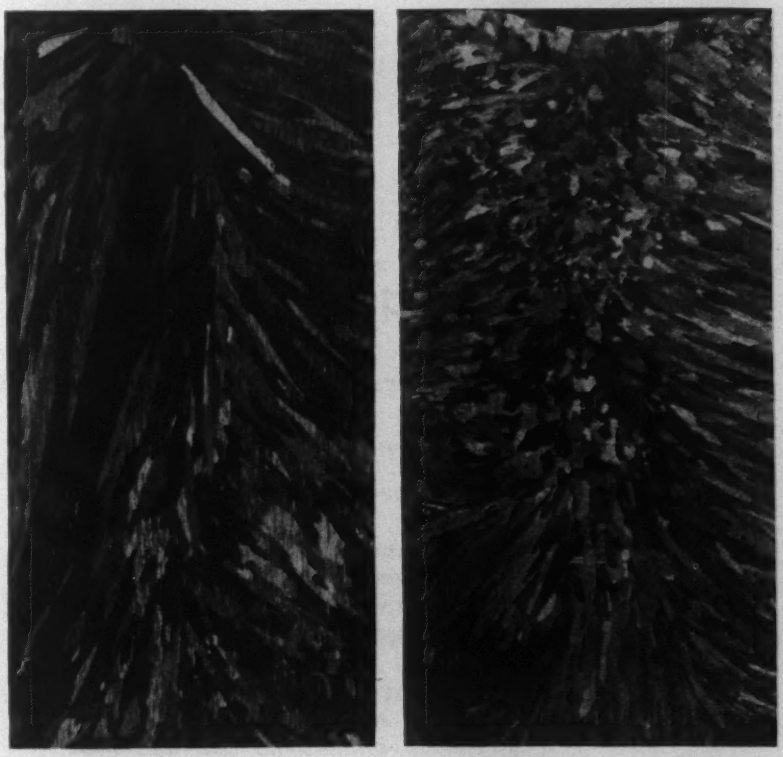
Reveals Effects—Etched stainless steel specimens examined under polarized light point up the results. The standard weld contains very large columnar crystals which traverse the thickness of the material. Magnetically stirred welds tend to have irregular, but non-columnar, grains at the weld surface and fine columnar grains below these.

A stainless steel weld, made with ACP magnetic stirring showed severe bending of columnar grains at the point of polarity reversal. This reveals that the structure was affected by the interaction of the magnetic field and electrode current.

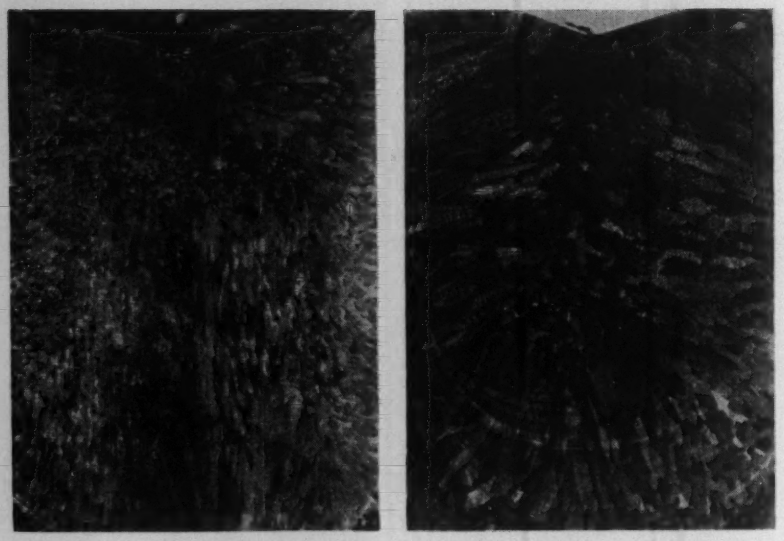
However, when ACP stirring was used at 60 cps, the finest structure appeared. Grain size in the steel



SMALLER GRAINS: Magnetic stirring of aluminum sample (left) also reduces grain size. But the sample refined by the alternating coil polarity (ACP) technique (right) shows the best results of all methods tested.



EQUIAXED GRAINS SHOW UP: A high melting point metal, such as nickel, reveals course grains after normal arc melting (left). However, equiaxed grains appear in nickel (right) after negative pulse melting.



REFINES STRUCTURE: Nickel also responds to magnetic stirring during arc melting. Sample (left) shows some small grains. But the nickel specimen (right), refined by the ACP technique, displays best results.

appeared to be reduced by at least a factor of ten.

Helps Titanium Also — The results for titanium materials listed in the table show significant effects due to magnetic stirring. For these materials, the ACP technique at 0.5 cps appears to be best. This technique gives a grain size reduction of eight times in commercial titanium and of 18 times in the Ti-6A1-4V alloy. The value 0.2 grains/mm² for a standard weld in the latter alloy corresponds to a single grain in the thickness direction at the coarsest point.

In these welding experiments, the magnetic stirring coil was not water-cooled as is customary. Thus, there was much heating of the coils. Greater refinement could be expected from water cooling the coils.

Grain refining effects due to magnetic stirring are believed to derive from two sources. One is a direct influence on the liquid-to-solid nucleation rate; the second is a change in the environment of the nucleating region.

Timing is Factor — Tests using mechanical-rotational motion reveal that grain refinement occurs only when solidification and acceleration of the liquid occur together. This gives rise to a high degree of relative motion, or viscous shear, between adjacent layers of atoms in the liquid.

This is what happens. Consider a critical-sized embryo. Under high viscous shear, the relative motion of liquid atoms with respect to the embryo surface results in an increase in the number of different atoms to which it is exposed per unit time. Since embryo growth rate depends upon this factor, the rate of nucleation goes up.

A further effect on nucleation is due to turbulence. (The ACP technique is very effective towards this end.) Thus, magnetic stirring, especially the alternating coil polarity (ACP) technique, offers great promise for refining the as-cast structure of metals deposited by arc melting and arc welding processes.

Stirring Technique Improves Weldments

Results of Magnetic Stirring In Arc Welding Titanium Materials

Material	Magnetic Coil Conditioners	Grain Size, grains/mm²* Surface	Section
Titanium (commercial purity)	Standard	—	1.3
	8000 amp-turns, 0.5 cps ACP	—	10.2
	8000 amp-turns	—	5.1
	8000 amp-turns		3.8
	9000 amp-turns, 60 cps ACP		5.7
Ti-6Al-4V	Standard	2.3	0.2
	16,000 amp-turns	3.1	3.7
	16,000 amp-turns, 0.5 cps ACP	4.5	3.7
	18,000 amp-turns, 60 cps ACP	2.6	2.1

*Grain size measured at coarsest area of transverse section of weld.

Spherical Powders Find New Uses

Metal powders in spherical form point up many advantages.

Sintered parts and solid fuel rocket propellants are only a couple uses for the micron-sized metals.

■ A process for producing spherical powders of pure metals and metal alloys has been developed by Linde Co., Div. of Union Carbide Corp., New York. The particles range in size from 20 to 150 microns with a uniformity rate of 98 pct.

Spherical powders raise the quality of sintered parts. They also reduce the hazards of handling highly reactive materials such as Zircaloy II. Additives of aluminum spherical powders raise the thrust of solid fuel rocket propellants.

Produced in a totally inert atmosphere, the tiny particles are free of voids, cavities and inclusions. A variety of uses which take advantage of their uniform spherical shape have already been projected for the new powders.

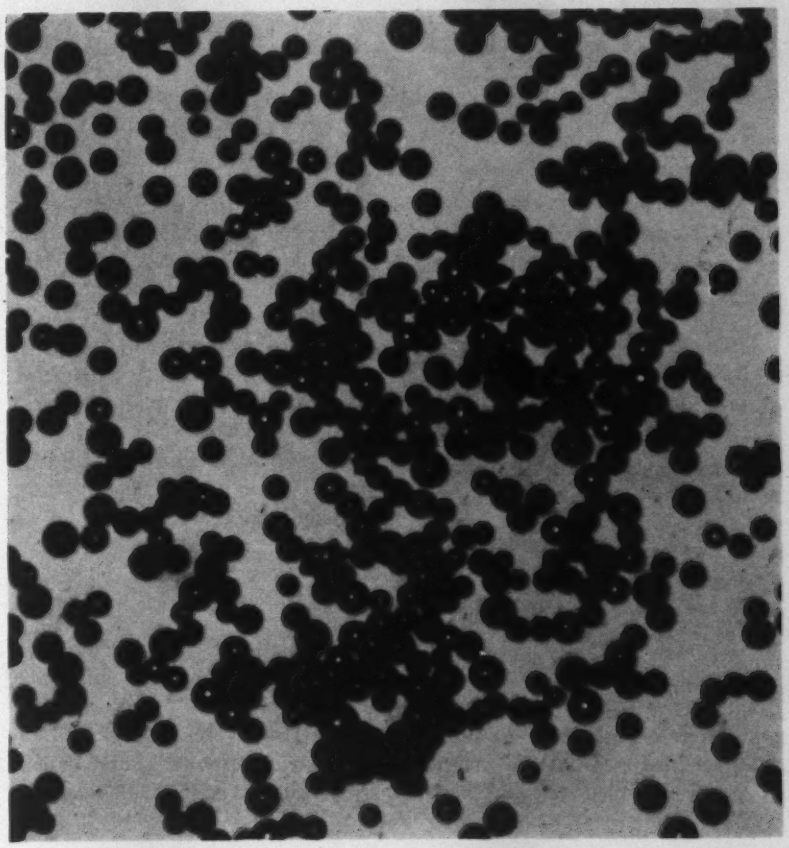
What Types are Made?—Six different powders are being made in limited quantities. They are copper, aluminum, nickel, type 316 stainless steel, tungsten and Nichrome.

Other types will be added as the needs arise. A development program is also under way on products with a particle size below 20 microns.

Spherical powders create applications which can take advantage of their uniform shape. For instance, such powders may be used to fabricate sintered bodies requiring controlled porosity. This suggests usage in filters, burner plates, sweat cooled nozzles, porous piston rings, and the like.

Improves Mold Flow—The addition of from 10 to 20 pct of spherical particles improves the flow of angular powder particles into molds and raises the quality of sintered powder parts.

Highly reactive powders may be handled with less hazard when they are spherical and have as a result, the lowest possible surface to volume ratio.



UNIFORM SPHERES—Size and shape of spherical particles are accurately controlled. Magnified 100 diameters the largest size is 20 microns.

In the laboratory, spherical powders are very accurately separated into various particle size ranges. Since most particle-size analyzing equipment assumes that all powders are spherical, it is logical that a sample of spherical powder can be used as a standard to calibrate the equipment.

How It's Processed—Starting material to make the spherical powders is 1/16-in. diameter wire of uniform cross-section. The material must be free from surface imperfections.

Powders are produced in a totally inert atmosphere to maintain high purity in the finished state. Since no impurities are introduced during manufacture, the only limiting factor is the purity of the metals.

Due to handling, storage, and shipment, powders may contain varying degrees of surface oxidation. However, a completely inert atmosphere throughout has been accomplished, and is available whenever oxides cannot be tolerated.

Final Check — Size control and uniformity are maintained by screening the spherical powders through standard ASTM sieves of 100, 175, 200, and 325 mesh sizes. The minus 325 mesh material is analyzed in a Fisher sub-sieve sizer to find the average size and a Roller Analyzer to determine size distribution.

How Hearth Control Affects Electric-Furnace Output

By **Erwin Franzen**—Supt. of the Melt Shop, A. Finkl & Sons Co., Chicago

A newly rammed hearth should slope toward the center of an electric furnace. It should present a wide melting area.

On the bottom, heavy scrap melts fast while the hot bath cleans up the hearth floor.

■ Maintenance of an electric-furnace hearth — or bottom as it's commonly called — presents never-ending problems. Many factors are directly influenced by the bottom of a furnace. Among these factors are electrode breakage and refractory life.

Ideal Hearth—Before discussing preventive maintenance, let's consider the shape of an ideal hearth. A newly rammed hearth should slope toward the center of the furnace. The base of its banks should be shallow. They must not infringe on the "flat" which forms the actual floor of the hearth.

Furnace capacity varies directly wtih changes in the flat's diameter. An ideal flat equals about two-thirds of the hearth diameter.

Most bank maintenance centers on the upper half or slag-line area. It's hard to prevent loose refractories from building up at the base of the bank. Buildups reduce the flat area.

Melting Rates—A large flat area, slightly dished, gives the fluid metal a greater area over which to spread. It thus causes the heavy scrap to melt while the power source is near the bottom. The hot bath cleans up scrap over the entire flat area.

Too small a flat causes the primary bath to rise too rapidly. Metal formed by the arc's flash submerges the scrap and isolates it. Melting bottom-area scrap in the latter stages of the heat wastes time and power because of the violent boil.

Heavy scrap left unmelted on the bottom also chills and inactivates the bath. This retards effective bath melting and slows the overall melting rate.

If the flat is too deeply dished, it inclines the scrap toward the center. As a result, the scrap bridges early in the heat. The angle of the bottom slope tends to support scrap-bridge footings. This prevents the scrap from sinking in the bath.

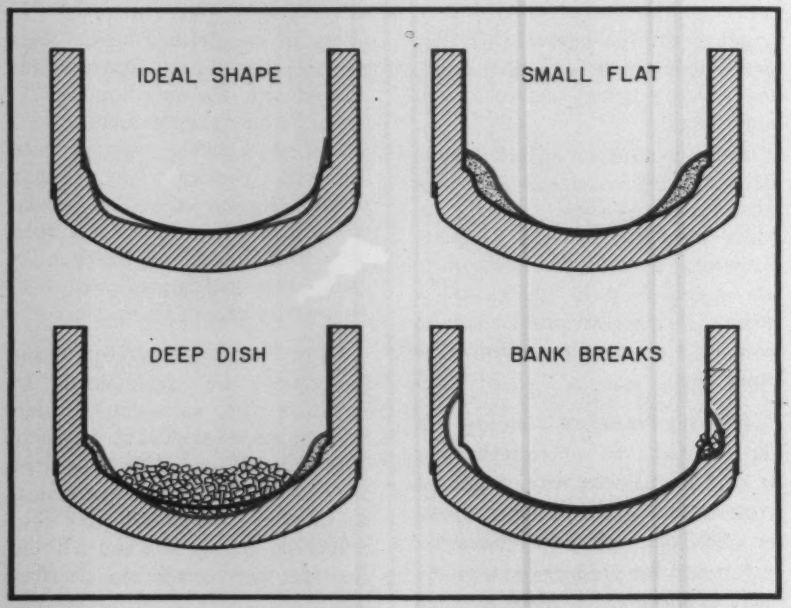
Slag-Line Breakouts—Most breakouts occur at the slag-line area. For this reason, it's vital that good bank thickness be maintained at this area. Failure to maintain proper bank thickness at the slag line allows the banks to act as shelves for the scrap.

If scrap cannot be dislodged from the bank's shelves, melting time is affected. The delay continues until the scrap is completely melted from underneath.

Every shop has its own problems relating to bottom control. Shops that make only low-carbon steels are seldom plagued with high bottoms. However, they face another major problem. They must maintain adequate bottom thickness.

Shops that produce high-carbon heats have a problem with high bottoms. This problem is very hard to handle. The disadvantages of operating a high-bottomed furnace are numerous and costly.

Bottom Contour Alters Bath



Washout Hazards—High tons per heat can best be obtained by making large heats. This is impossible with high bottoms. High bottoms increase the skulling of charging pans. They also increase the frequency of lining breakouts and steel runouts during recharging and carbon blows.

Hazards of breast washouts, which could injure someone, are greatly reduced when heats remain at normal levels. Most breakouts occur in the slag-line area. Many are caused by heats that lie high on the brickwork — instead of being contained by the banks.

The greatest cause of high bottoms centers on improper draining of the slag. Every heat, and especially high-carbon ones, leaves a slag residue on the bottom. Often this isn't apparent unless the slag is quite viscous or caked. But the cumulative effort can be damaging.

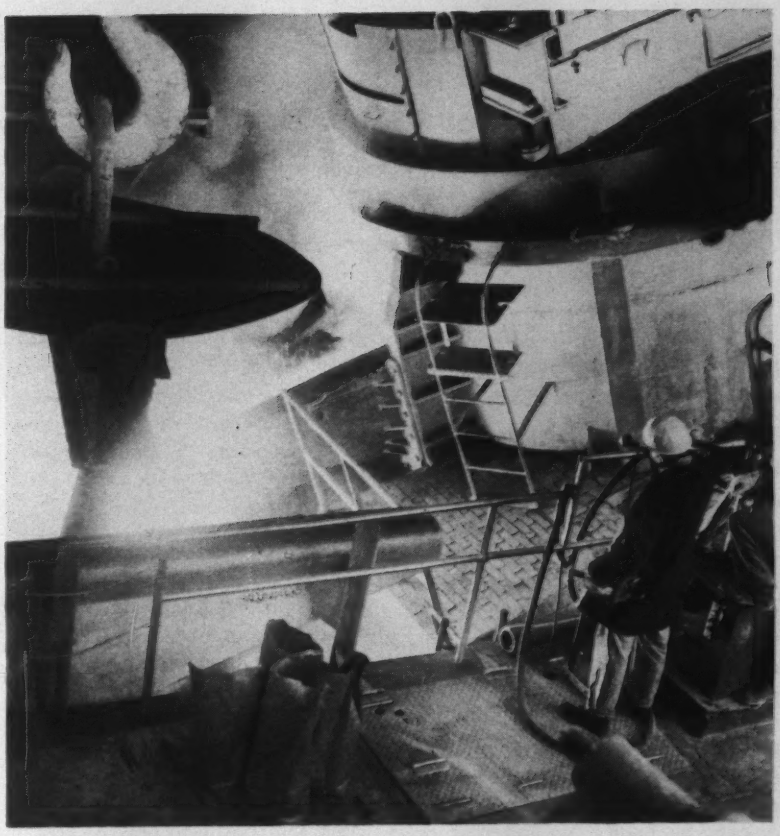
Remove High Bottoms—If bad practices by furnace men are eliminated, most high-bottom problems disappear. Charging 10- to 20-pct broken molds or blast-furnace iron for a few heats erodes heavy banks. The higher the silicon content, the faster the erosion rate.

Spar effectively cuts away excess bottom material. It's most effective when it is charged shortly after the power is on. If the flats or the banks are quite high, spread the spar directly on them—right after tapping —while the furnace is at its hottest.

Some shops spar down the bottom, close the doors and re-drain the furnace after each heat. This proves very effective.

Silicon or aluminum can be used directly on high spots. These materials localize cutting, but they're costly. There are other drastic methods of removing high bottoms. However, if good practice is used the problem doesn't crop up. It's a lot easier to control buildups than it is to cure them.

General Care—Maintenance covers a wide scope. The melter foreman and his first helper should check each bottom after the heat is tapped.



TAPPING THE FURNACE: An electric furnace discharges a 75,000-lb heat of alloy steel. The man on the left takes a temperature reading by checking the brightness of the melt with a light-sensitive instrument.

Holes in the flat and lower banks must be repaired first. This often calls for probing with a bar or pipe to decide how serious the damage may be.

Sometimes the tape-hole bank is undercut. When this happens the furnace will not drain unless it is cut down or lanced through.

Generally the steel in the flat cavity is frozen by the time lancing takes place. If the hole isn't too serious it can be left until the following heat. It should then be patched, after obtaining a good drain.

If the hole is deep, use a small scrap or hot metal charge to "wash" the skull out. After draining, patching can take place.

No Mixing—Double-burned dolomite serves as patching material in most shops. It requires no mixing and isn't very expensive.

Care of the upper part of the banks and the slag-line area is of prime importance. These areas are where most of the breakouts occur. Since the steel is hottest on top, the slag-line area is most vulnerable.

Many shops strengthen the upper part of the banks during the heat with black dolomite. After two-thirds of the scrap is melted, a belt of dolomite is gunned or shoveled in around the entire furnace.

To effectively patch walls, the banks must be thick enough to support the patch material. Ledges and bellies must be eliminated at the slag-line area.

If a vertical contour is formed between the banks and the upper lining, the situation is ideal. Gunning, when properly done, proves very effective. It's standard practice between heats in some shops.

Self-Locking Aluminum Panels Speed Construction Work

By **K. Glaser**—Dir. of Engrg., Design Section, Reynolds Metals Co., Richmond, Va.

You have little to fear if the joint is just as strong as the connected metal members.

That's the case with a new line of extruded aluminum panels that snap into place.

■ Aluminum has been used for years to trim weight off superstructures in ships. The metal holds up well in corrosive marine atmospheres, too.

Recent designs in aluminum extrusions add greater strength and economy to such structures. The new sections can be assembled quickly by hand. No fasteners or welds are needed to hold the extrusions intact. The extrusions themselves are self-fastening.

At present, the big targets for these extrusions are in shipbuilding, truck trailers and containers. Superstructures, floors, side walls and roofs are typical examples.

Snap Motion—The principle behind the new design makes the engaging elements integral parts of the shapes. As soon as one extrusion is snapped on to another, a stiffened panel comes into being.

The Sun Shipbuilding and Dry Dock Co., Chester, Pa., put the new concept to work on a wheelhouse and dummy stack assembly. The whole job consumed only 33,000 lb of Snap-Lock extrusions, as they're called. Conventional aluminum construction would have required 40,000 lb to erect the same structure.

Interlocking Snap-Lock extrusions are elastically deformed mating shapes. Once they are rotated into place, they lock. The friction in the joint gives a good shear transfer between the extrusions.

At the Shipyard—The first job of its kind is the wheelhouse on the "Mormacpride," built by Sun Ship for Moore-McCormack Lines, Inc. The wheelhouse is 42 ft wide, 53 ft long and 8½ ft tall. A vital part of this structure is its 33-ft diam dummy stack which rises 10 ft above the top of the wheelhouse itself.

One extruded shape was used to assemble the dummy stack. Alloy 6061-T6 was selected for the job. The extrusion has a net width of 8 in. with a typical wall thickness of ⅛ in. It's designed to carry 135 lb per sq ft on an 8-ft span.

Each extruded shape weighs 4½ lb per sq ft. This gives a 1:30 weight-to-load ratio. The lengths vary from 8 to 33 ft. Hardly any cutting or trimming was done at the yard.

Little Tooling—A big factor was manpower. Depending on the length of the panel, one to four men were able to snap the shapes into place. Simple squeeze pincers were all the tooling required. Curved surfaces, such as the wheelhouse front, were made by bending the shapes to conform with the required design.

When building curved conical surfaces, as in the case of the dummy stack, skew cuts have to be made. The connection to the next

SHOP ASSEMBLY: Lower aft portion of dummy stack is assembled in the shop. Rivets join the segments to the formed boundary angles.

panel is than made with riveted butt straps. Cuts are made with high-speed electrical hand saws.

A sealant has to be applied between the extrusions to insure a weather-tight joint. A polysulfide compound is applied in the joint with a caulking gun prior to snapping. The sealant retains its plasticity and increases the shear strength of the joint to 1600 lb per lineal ft.

Another Gain — Bi-metallic corrosion can be avoided, too, whenever aluminum and steel are connected together. First, you have to paint both metal surfaces with a lead - free, zinc - chromate primer. Then coat both surfaces with a non-drying, trowel-grade, butyl-rubber compound.

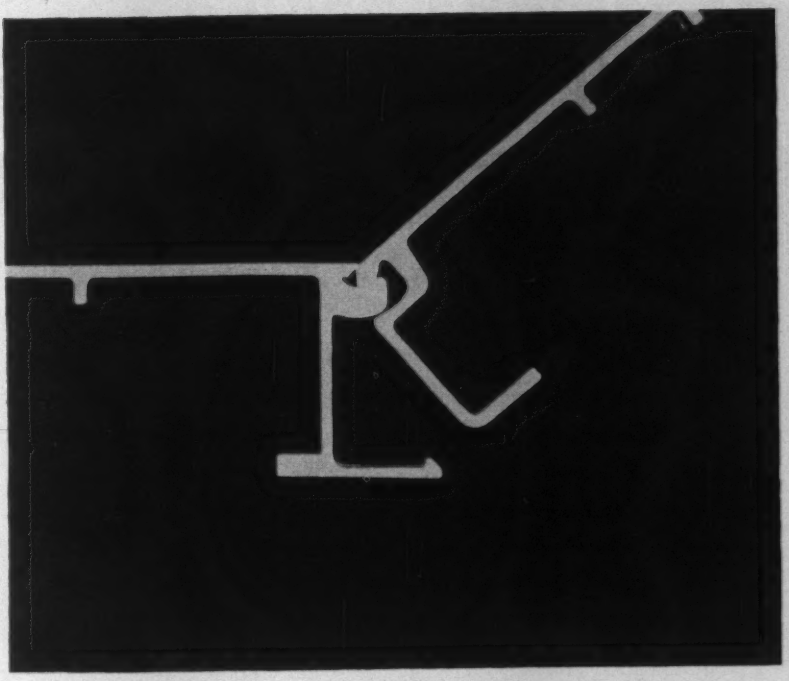
Entire sections are assembled in the shop. They're then lifted "in place" aboard ship. Attachments, such as portholes, windows, doors and clamps, were riveted to the extruded panels. Rivets also joined the house structure to boundary angles. Cold-driven, brazier-head aluminum rivets were used.

Suppose this same job were done by welding 5/16-in. aluminum plate to 4- x 3-in. angle stiffeners. How would costs compare with Snap-Lock extrusions?

Many Savings—Extruded panels would be about 17 pct lighter. Material costs would be 22 pct less than conventional construction. The biggest saving is in labor. Here, extruded panels would reduce costs by about 42 pct. At Sun Ship, that adds up to an overall saving of 32 pct.

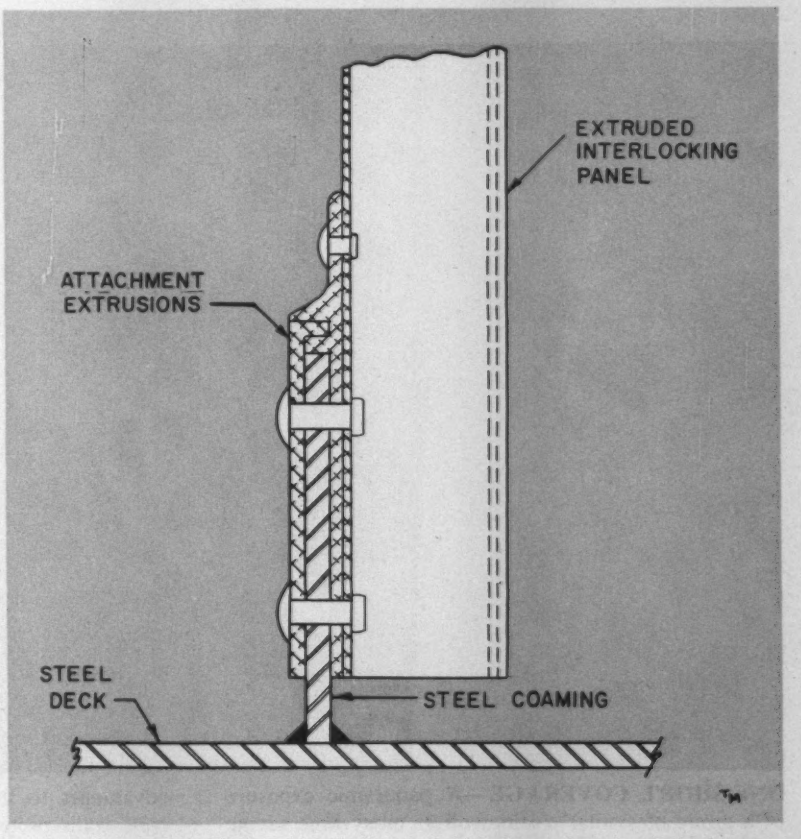
Does this figure seem high? Bear in mind that direct labor cost in deckhouse construction usually takes up two-thirds of the total cost. Therefore, any savings in this field is very important to a shipyard.

The sealed joint offers an added advantage. Vertically-installed extrusions (since they have so many joints) form a flexible assembly that gives with the motion of the ship. Greatly feared stress concentrations are thus eliminated. Stresses due to thermal expansion traits of aluminum and steel are also reduced.



SNAP FEATURE: Hinge area is filled with sealant. Then the sections are snapped into place by rotating one member into horizontal position.

Joins Steel to Aluminum



Design for Gamma-Ray Safety

Designing radiographic inspection cells calls for the utmost in safety.

If you're thinking of using cobalt 60 as a source, here are some points to consider.

■ To keep up with demands on quality control, steel companies are quick to install radiographic equipment that best suits their inspection needs. At the same time, they must keep safety well in mind.

Knowing the hazards of uncontrolled radiation, Farrell - Cheek Steel Co., Sandusky, Ohio, designed its newest building to the most rigid specifications for the protection of personnel.

The building is used in conjunction with and adjacent to the present X-ray facility. It houses a 5.25 curie source of cobalt 60.

Sound Construction—The building is of concrete, brick-faced construction. The walls are 13 ft high and 27 in. thick from sub-base to top. The concrete is of a special high-density type.

Confinement of gamma rays such as this prevents radiation injury to personnel. All entrances, including those from outside of the building, are equipped with flashing red lights operated by a Gammalarm System.

Added Protection—The Gammalarm system also controls all entrances by electrically locking doors as soon as the cobalt 60 source is exposed. Doors unlock automatically when the source is fully retracted into the storage chest.

The roof is barricaded and guarded by flashing red lights. Approved AEC radiation warning signs are also posted at all required locations. Entrance to the gamma-ray room is by way of a concrete maze about 8 ft wide. This width permits access of electric trucks for materials handling.

An electrically-operated hoist, with rails mounted atop the walls, positions the heavier castings. All personnel using the gamma ray equipment are required to wear film badges. These are checked weekly and a record kept of all exposure readings.

Why Gamma Ray? — Casting section thicknesses vary from a fraction of an inch to 6 in. or more. This extreme range of radiographic penetration, added to the advantages of making exposures through multiple castings, or numerous sections of a single casting simultaneously, are highly important to the inspection program.

ONE-SHORT COVERAGE—A panoramic exposure of a group of similar castings offers many time saving advantages to the inspection department. Thick concrete walls protect the operator from radiation injury.

Pre-Engineering by **KAISER ENGINEERS** answers basic plant expansion questions...

Raw Materials?

Your final decision to expand or build results from a series of important individual decisions. Raw material availability is one of them. Independent analysis of all aspects of your proposed program is the *Pre-Engineering* service offered by Kaiser Engineers. In addition, KE designs and builds for the Steel industry... offers skilled experience in all types of facilities from raw material plants to finishing mills. Whatever your requirements... from Pre-Engineering analyses through plant design and construction... Kaiser Engineers brings world-wide experience and ingenuity to their solution.

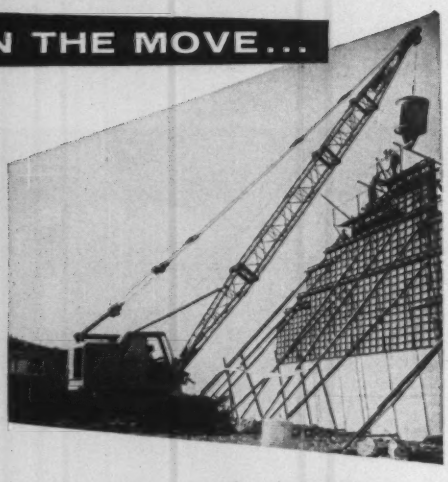
KAISER ENGINEERS

KAISER ENGINEERS engineers - contractors
Contracting since 1914

Oakland 12, Calif. — Chicago, New York, Pittsburgh, Washington, D.C.
Accra, Buenos Aires, Montreal, New Delhi, Rio de Janeiro, Sydney, Vancouver, Zurich

6231-S

MACHINES ON THE MOVE...



—equipped with

FAIRFIELD GEARS

GEARS to match the speed, size, and power of modern machines are a Fairfield specialty. This is possible because Fairfield is a leader in utilizing the most advanced methods, machines, and techniques for producing better gears. By specializing exclusively in "Fine Gears Made to Order", Fairfield has become one of America's largest independent producers of these parts.

If you use gears in the product you make, we believe it will pay you, as it has others, to become acquainted with FAIRFIELD—the place where fine gears are produced to meet your specifications EFFICIENTLY, ECONOMICALLY! Fairfield's production facilities are unexcelled. *Call or Write.*

FAIRFIELD MANUFACTURING CO., INC.

2319 South Concord Road • Lafayette, Indiana
TELEPHONE: 2-7353

A "PLUS VALUE" IN ANY PRODUCT

Gears and Differentials For FINE GEARS *Made to Order for:*

TRACTORS • HEAVY DUTY TRUCKS • AGRICULTURAL MACHINERY • POWER SHOVELS AND CRANES
MINING MACHINES • ROAD GRADERS • BUSES • STREET SWEEPERS • INDUSTRIAL LIFT TRUCKS

PATENT REVIEW

New Patents In Metalworking

Controls Pellet Flow

Heat-treating fluent solids, F. D. De Vaney and D. Beggs (assigned to Erie Mining Co., Hibbing, Minn.), July 26, 1960. An electronic control mechanism automatically maintains a substantially uniform stockline in an iron-ore pellet indurating furnace. No. 2,946,469.

Anchors Hot Top

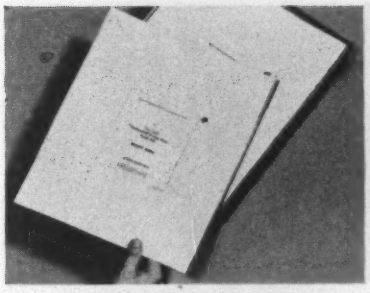
Hot tops, E. Vallak, July 26, 1960. In a method for anchoring a hot top to a mold, an element attached to the hot top extends into the portion of the melt which solidifies first. This freezes the hot top to the solidifying shell of the molten metal in the mold. No. 2,946,103.

Spheroidized Steel

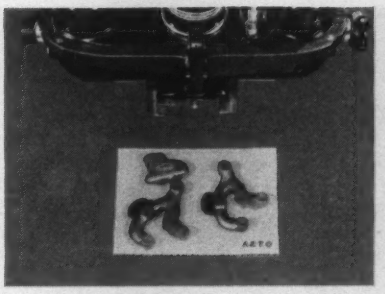
Method of spheroidizing steel by rapidly heating, C. A. Turner, Jr. (assigned to Selas Corp. of America, Dresher, Pa.), May 31, 1960. In a method for spheroidizing carbon or low-alloy steel, the cold-worked steel wire or strip is moved through a heating furnace at controlled speed. This insures its reaching the desired temperature at the moment it leaves the furnace. It is then immediately air cooled. No. 2,938,820.

Makes Pellets

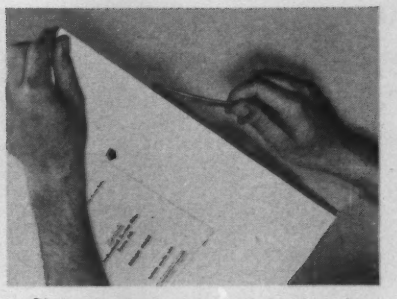
Apparatus for forming pellets from pulverulent material, A. W. Mathews and J. J. Banke, July 26, 1960. In the continuous pelletization of finely-divided iron-oxide ore, the moist ore is fed onto a belt directed upwardly, at a progressively increasing pitch. Small pieces of the compacted ore roll back down the belt. No. 2,946,086.



1) No darkroom loading. Ready for exposure as it comes from the box.



2) Just place in position and expose —the film is protected from dust, dirt, light and moisture.



3) In the darkroom, pull the rip strip, remove film, and process.

...NEW!... READY PACK ....

Kodak Industrial X-ray Film

- Sealed tight until processed—keeps clean
- Very convenient to handle—saves time
- Readily available in Type AA and Type M

Here's new convenience when you are inspecting aluminum or magnesium alloys, thin steels, plastic or anything where lead screens are not required.

Kodak Industrial X-ray Film, Type AA and Type M-Ready Pack comes to you with each sheet sealed in a light-tight envelope ready for exposure. A convenient rip strip makes it easy to open in the darkroom.

These films come 75 to a box in sizes 8 x 10, 10 x 12, 11 x 14, 14 x 17. Order them from your Kodak X-ray dealer.

EASTMAN KODAK COMPANY
X-ray Division • Rochester 4, N. Y.

Kodak
TRADE MARK

We have the facilities; the know-how is free

Consider these three, of many, reasons why it is to your advantage to let us fabricate your laminated plastics parts.

First, we have the facilities for the job. Saws, millers, drills, lathes, punch presses, planers, sanders. Hundreds of them. Many are standard machine tools modified to machine laminated plastics quickly and easily. Others are special, designed primarily for the high-speed production possible with laminated plastics.

Second, behind the machines are people who know practically every trick in the book for turning out a first-class job fast. They also know what to avoid doing.

Finally, it will hardly pay you to handle your own fabrication—in terms of money, in headaches, in possible errors, waste or delays. Call a Synthane representative near you for a quotation—you'll find him in any principal city or write Synthane Corp., 56 River Road, Oaks, Pa.

You furnish the print—we'll furnish the part

SYNTHANE CORPORATION OAKS, PENNA.

Sheets • Rods • Tubes • Fabricated Parts
Molded-laminated • Molded-macerated

New Catalogues And Bulletins

Money-saving products and services are described in the literature briefed here. For your copy, just circle the number on the free postcard.

Finishing Silver Plate

Information on decorative finishing of silver-plated articles is presented on a technical data sheet. Data includes abrasive compound grades, buffing-wheel speeds and operating instructions. (The Lea Mfg. Co.)

For free copy circle No. 1 on postcard

Ultrasonic Generator

A data sheet describes an ultrasonic generator. The generator is rated at an output of 1000 w average power and 2000 w peak power at 38 to 42 kc. The data sheet includes equipment, photos, description, and specifications. (National Ultrasonic Corp.)

For free copy circle No. 2 on postcard

Data Analysis

A technique for hand analysis of complex engineering data in 10, 20, or more variables, is included in 16 pages of technical literature. (Statistical Engineering Institute)

For free copy circle No. 3 on postcard

Safety Tools

The more popular items in a safety-tool line are illustrated in a brochure. The four-page bulletin lists and describes the stock numbers and sizes of such tools as wire brushes, hammers, scrapers, pliers, shovels, and wrenches. (Ampco Metal, Inc.)

For free copy circle No. 4 on postcard

Oil-Tight Pushbuttons

Industrial miniature oil-tight pushbuttons are covered in a 10 page booklet. Illustrations and photos describe the flexibility and appearance advantages of the new line; also showing how it can reduce panel-space requirements at least 40 pct. Dimensions, ratings, outlines and drawings are provided. (General Electric Co.)

For free copy circle No. 5 on postcard

Air Conditioners

Describing packaged air conditioners, a 12-page illustrated bulletin discusses performance characteristics and engineering features of the line. Typical installation photos in full color, show units with and without discharge plenum. They are included to illustrate a discussion of owner advantages of the packaged air conditioners. (American Radiator & Standard Sanitary Corp.)

For free copy circle No. 6 on postcard

Hose Fittings

A four-page bulletin, on nylon pressure hose, contains a hose selector and data on a complete range of reusable fittings. Instructions for applying fittings and information on ordering assemblies is included. (The Polymer Corp.)

For free copy circle No. 7 on postcard

Working Compounds

Variations of three trademarked working compounds are dealt with in a folder. They are: "Steelskin," for steel drawing; "Redskin," for copper coating of steel; and "Copperskin," for drawing copper and its alloys. (R. H. Miller Co.)

For free copy circle No. 8 on postcard

Meehanite Metal

Specifications for five different types of Meehanite Nodular is provided in an eight-page brochure. (For free copy write on company letterhead to Meehanite Metal Corp., 714 North Ave., New Rochelle, N. Y.)

CO_2 and Welding

The uses of carbon dioxide (CO_2) in the welding industry are given

Postcard valid 8 weeks only. After that use own letterhead fully describing item wanted. 9/8/60

Circle numbers for Free Technical Literature, Design Digest, or New Equipment:

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90

If you want more details on products advertised in this issue fill in below:

Page ..... Product .....

Page ..... Product .....

Page ..... Product .....

INVALID WITHOUT COMPANY NAME—PLEASE TYPE OR PRINT

Name .....

Title .....

Product Manufactured .....

Company .....

Co. Address .....

.....

City ..... Zone .... State .....

FIRST CLASS
PERMIT No. 36
NEW YORK, N. Y.

BUSINESS REPLY MAIL
No postage necessary if mailed in the United States

POSTAGE WILL BE PAID BY

THE IRON AGE
Post Office Box 77, Village Station
NEW YORK 14, N. Y.

FIRST CLASS
PERMIT No. 36
NEW YORK, N. Y.

BUSINESS REPLY MAIL
No postage necessary if mailed in the United States

POSTAGE WILL BE PAID BY

THE IRON AGE
Post Office Box 77, Village Station
NEW YORK 14, N. Y.

Postcard valid 8 weeks only. After that use own letterhead fully describing item wanted. **9/8/60**

Circle numbers for Free Technical Literature, Design Digest, or New Equipment:

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90

If you want more details on products advertised in this issue fill in below:

Page ..... Product .....

Page ..... Product .....

Page ..... Product .....

INVALID WITHOUT COMPANY NAME—PLEASE TYPE OR PRINT

Name .....

Title .....

Product Manufactured .....

Company .....

Co. Address .....

.....

City ..... Zone .... State .....

FREE LITERATURE

in an eight-page brochure. Liberally illustrated, it covers the characteristics of CO_2 gas-shielded, metal-arc welding of mild steel and low-alloy steel; the advantages of CO_2 in welding, and the various welding processes employing carbon dioxide as a shielding gas. (Pure Carbonic Co.)

For free copy circle No. 9 on postcard

Collars

Steel and cast iron shaft collars are reviewed in a catalog. It includes specification information for all sizes up to 4-15/16 in. bore diam. The bulletin also reviews optional self-locking screw feature, available where locking action is desired with plain cup or flat point screw. (Standard Pressed Steel Co.)

For free copy circle No. 10 on postcard

Servo Motor

A data sheet illustrates and gives complete electrical, mechanical and physical characteristics; outline drawings, schematic and torque curve of an inertially damped motor. It is designed for military and other high-speed and/or high-gain servo systems. (John Oster Mfg. Co.)

For free copy circle No. 11 on postcard

Cleans Castings

An informative brochure presents data on dual-purpose core knock-out and blast-cleaning equipment for the foundry industry. The folder contains diagrams and drawings of this machine—how it works, photographs of castings before and after core knock-out and cleaning, and case-history information. (Wheelabrator Corp.)

For free copy circle No. 12 on postcard

Tungsten Chemicals

A consolidated listing of five standard high-purity tungsten chemicals is contained in a catalog. Specifications in the new brochure include available grades, chemical composition, maximum impurity content, physical characteristics, packaging and applications. (Sylvania Electric Products Inc.)

For free copy circle No. 13 on postcard

Solid Lubricants

The theory and practice of lubrication by solids are the primary subjects in a new booklet. The booklet discusses boundary friction and the role of solid lubricants to reduce friction and wear under heavy loads and at high temperatures. The 24-page booklet describes the major advantages of molybdenum-disulfide solid lubricants. (The Alpha-Molykote Corp.)

For free copy circle No. 14 on postcard

Control Tape

A data sheet describes control tape for machine-tool control and data processing applications. Made of vulcanized fiber, the tape has toughness, durability, a low-stretch factor, and high opacity. The physical properties and specifications of the tape are outlined. (National Vulcanized Fibre Co.)

For free copy circle No. 15 on postcard

System of Milling

Nearly 500 throwaway insert milling cutter styles and sizes are listed in a new, 24-page catalog. The catalog covers the complete line of cutter bodies, cartridges, inserts and accessories for milling cast iron, steel, aluminum and nonferrous metals. (Valenite Metals)

For free copy circle No. 16 on postcard

Metallurgical Control

Spectrographic metallurgical control and its application to high-alloy steel castings are dealt with in a technical bulletin. The bulletin outlines the benefits to the steel castings users through increased accuracy of analyses, production speed, and uniform control and dependability of the end product. (Lebanon Steel Foundry)

For free copy circle No. 17 on postcard

Rotary Tables

A four-page illustrated bulletin describes new additions to a line of hand- and power-revolving index tables. All hand-revolving tables are now equipped with an air-oil mist which lifts even off-center loads. (The Cincinnati Gilbert Machine Tool Co.)

For free copy circle No. 18 on postcard

Strapping Machines

A folder illustrates the latest series of electric-powered strapping machines. The series combines high flexibility—both in pre-selected tension and in package dimensions — with high packaging speed and minimum operator fatigue. The four-page brochure charts characteristics of each of the four standardized general-purpose machines. (Signode Steel Strapping Co.)

For free copy circle No. 19 on postcard

Destination Philadelphia October 17

"The rate of advance of metal science is now so rapid that it is quite difficult to stay abreast of current knowledge even in our special fields. Attending the ASM Metal Shows is a most pleasant and effective means of exposing ourselves to the latest technical thought and developments."

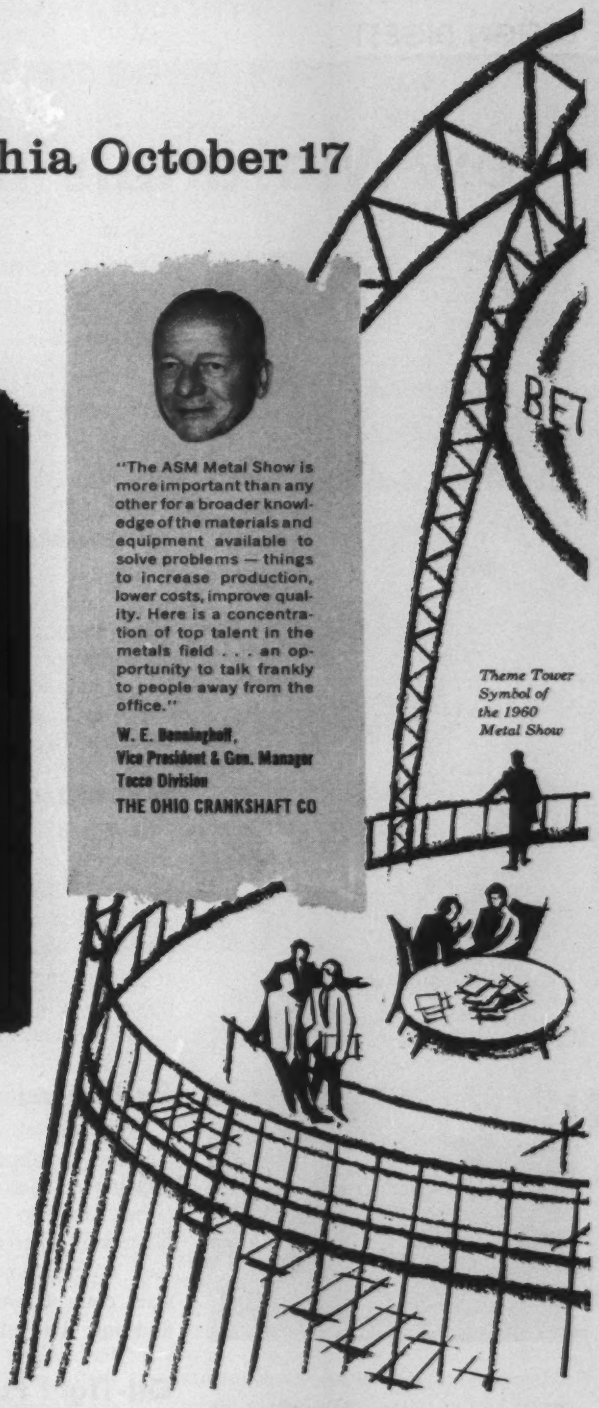
C. K. Donoho,
Chief Metallurgist
AMERICAN CAST IRON PIPE COMPANY

"Because the accent of the 1960 Metal Show is being placed on metals, their production engineering properties, fabrication and finishing, I expect to find information on all the newest materials, manufacturing processes and related equipment. I also expect to renew acquaintance with many of my metallurgical friends and make new ones."

Dr. Ralph W. E. Leiter,
Director of Laboratories
THE BUDD COMPANY

"The ASM Metal Show is more important than any other for a broader knowledge of the materials and equipment available to solve problems — things to increase production, lower costs, improve quality. Here is a concentration of top talent in the metals field . . . an opportunity to talk frankly to people away from the office."

W. E. Benninghoff,
Vice President & Gen. Manager
Tocco Division
THE OHIO CRANKSHAFT CO



Theme Tower Symbol of the 1960 Metal Show

Crossroads of metals and materials technology — the 1960 Philadelphia Metal Show! Here's your opportunity to see, hear, learn and profit . . . to increase your capability in the world of metals. This year, a new emphasis on metals and materials, processes and techniques will create a Metal Show that's truly exciting and different. You can see 300 exhibits and hear 250 technical papers. Urge your friends to go — ACT NOW TO ATTEND!

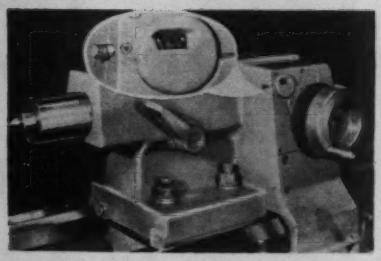
NATIONAL METAL CONGRESS and EXPOSITION

Philadelphia Trade & Convention Center • October 17-21

Sponsored by the AMERICAN SOCIETY FOR METALS *Metals Park • Novelty, Ohio*

Cooperating Activities: The Metallurgical Society of AIME; Society for Non-destructive Testing, Inc. Associations presenting technical sessions in cooperation with ASM: Metal Powder Industries Federation; Metal Treating Institute; Ultrasonic Manufacturers' Association; Industrial Heating Equipment Association; Special Libraries Association—Metals Division; American Society for Testing Materials—Committee B-9; and extensive research and engineering programs of the American Society for Metals, and ASM Seminars.

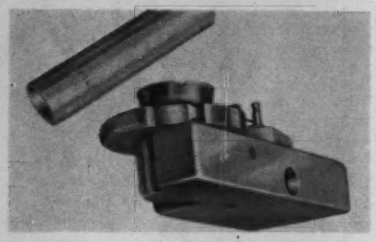
New Materials and Components



Counter Indicates Lathe Tailstock Settings

A direct-reading, digital traverse dial counter is a zero-setting device. It automatically shows the movement and setting of the tailstock spindle of a precision, heavy-duty lathe in 1/100 of an inch. It eliminates error-prone calculations and the possibility of costly mistakes in drilling and boring operations. The counter reset knob is to the left of the counter dial—out of the way. (Durant Mfg. Co.)

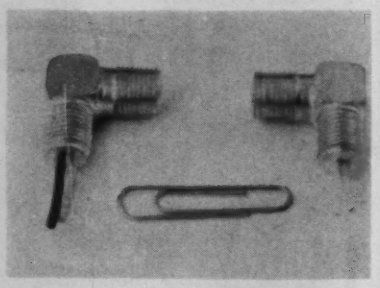
For more data circle No. 25 on postcard, p. 115



Screw-Machine Attachment Imprints Stock

Highly precise, an automatic screw machine attachment piece-marks round, hollow or solid stock. It is designed for screw machines and light marking on turret lathes from one to six spindles. It attaches to either front or rear cross-slide. The device consists of only two moving parts. Its application is simple. The advantages of the attachment are versatility and simple construction. (Sossner Steel Stamps, Inc.)

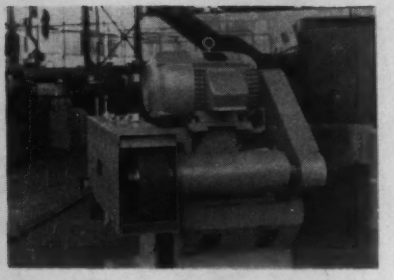
For more data circle No. 26 on postcard, p. 115



Miniature Electric Eyes Mount in Restricted Areas

Designed for the automation industries, small electric eyes render long, maintenance-free service. They offer industry a low-cost, practical approach to monitoring, counting and positioning of any object passing or dropping through a light beam. The pick-up units have a ¼-in. standard pipe thread for easy mounting. The units can operate relays when a direct light beam is interrupted by a passing object. They can also operate on reflected light from a surface. (Photomation, Inc.)

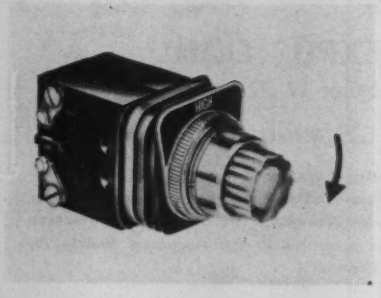
For more data circle No. 27 on postcard, p. 115



Belt Grinding Device Removes Heavy Stock

Equipped with heavy taper nose spindle, an abrasive belt grinding attachment mounts on heavy-duty lathes. It also mounts on mills, planers or other machine tools. The unit is capable of close-tolerance size control and low microinch finishing, limited only by the accuracy of the machine on which it is installed. The standard model comes with either right- or left-hand assembly. It uses a 12-in. diam contact wheel and abrasive belts up to 4-in. wide, 86-in. long. (Production Machine Co.)

For more data circle No. 28 on postcard, p. 115

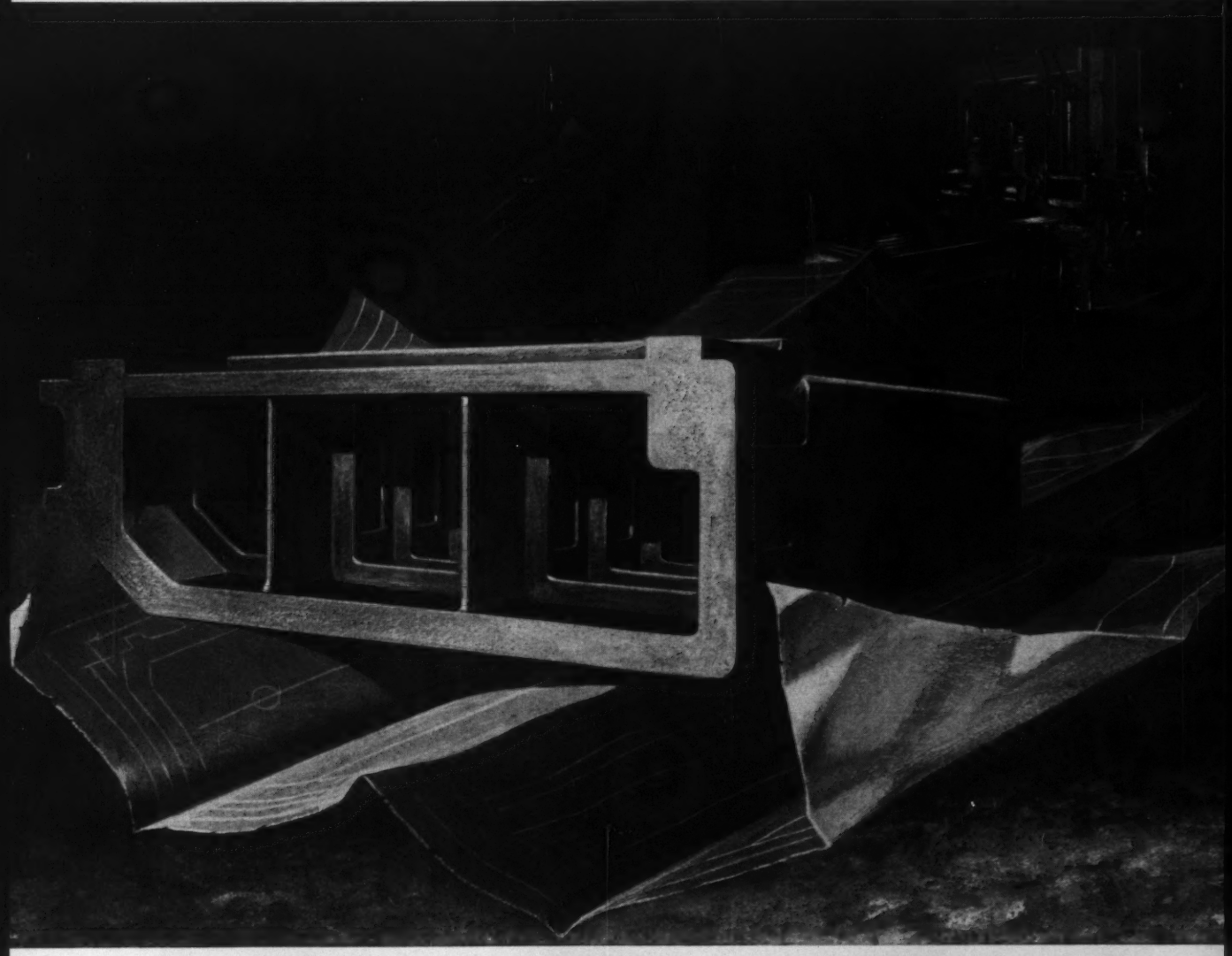


Oil-Tight Push-Button Performs Three Functions

One push-button unit saves panel space, installation time and cuts total control costs by combining the push button and pilot light in a single unit. It also provides a test to determine if the lamp is burned out. Before pushing the button to start the equipment, the button is given a half turn. This energizes the lamp circuit without affecting the control circuit; it shows whether or not the lamp lights. A similar test can be applied if the pilot should go out after a motor has been started. (Arrow-Hart & Hegeman Electric Co.)

For more data circle No. 29 on postcard, p. 115

How the Foundry Industry Serves America . . . #7 of a Series



EVEN ON A SHORT RUN, IRON CASTINGS BEAT FABRICATING COSTS BY $2,984

Originally the right- and left-hand columns for this new heavy-duty planer were designed for weldments at a cost of $10,400 each. However, the blueprints indicated some difficult-to-weld elements. So, despite the fact that there was only a short run of two orders, the cost-saving possibilities of gray iron castings were thoroughly explored.

The cost of making sectional core boxes for both the molds and the cores came to $7,000. With the co-operation of the foundryman and pattern maker, they were made reversible to obtain either a right-hand or left-hand casting. The total production cost for two pairs of the 16,900-lb. gray iron castings, including patterns, came to only $17,816 vs. $20,800 for welded columns . . . a measurable savings of 14.3%.

This is just another example of how the intelligent use of versatile iron castings can solve many short run industrial design problems, and effect important fabricating economies at the same time.

For the production of structurally sound iron castings, Hanna Furnace provides foundries with all regular grades of pig iron . . . foundry, malleable, Bessemer, intermediate low phosphorous, as well as HANNA-TITE® and Hanna Silvery.

Facts from files of Gray Iron Founders' Society, Inc.

HANNA
THE BEST KNOWN NAME IN IRON

THE HANNA FURNACE CORPORATION
Buffalo • Detroit • New York • Philadelphia

Hanna Furnace is a division of **NATIONAL STEEL CORPORATION**

DESIGN DIGEST

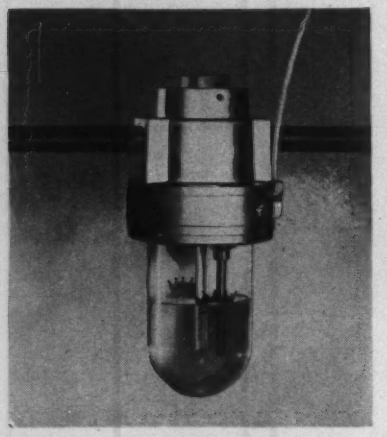
Power Turntable

A new power turntable permits 180° turns in conveyor lines within an area of 48 in. or less. This table is driven by a standard electric motor. Steel guide rails maintain alignment of products through the turning operation. Entry and departure points can be equipped with either wheel or roller spurs for connection with conveyor lines. (Metzgar Conveyor Co.)

For more data circle No. 30 on postcard, p. 115

Lubrication Device

A new method speeds lubrication of air-operated devices. The system operates on pressure variations (pulses) and is entirely independent of air-flow rates and duration of flow periods. Because the outlet end of the oil delivery line may be placed in any location, oil delivery to the exact spot desired is assured —without the need for a costly, auxiliary pressurized oil supply. Advantages of the new unit include positive lubrication of air-operated equipment, even when such equipment is located in high, overhead

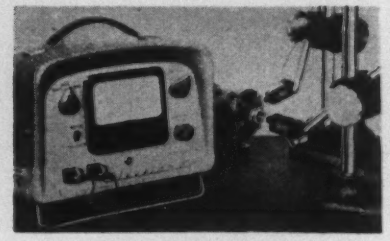


places and even when air flow through the lubricator is very low and/or infrequent. (Hannifin Co., a div. of Park-Hannifin Corp.)

For more data circle No. 31 on postcard, p. 115

Differential Gaging

With differential-gaging techniques, a wide range of measurements is now possible. These measurements cover such areas as concentricity, roundness, size, diameter, taper, flatness, profile, cam contour parrallelism, squareness, lead-screw pitch, wall thickness and others. Typical uses include measurement of the true roundness of journals on parts weighing up to



four tons while in the production machine, and concentricity of I. D. and O. D. of small bearings using non-precision spindles. The basic equipment required consists of two identical gage heads and a differential input amplifier. (Cleveland Instrument Co.)

For more data circle No. 32 on postcard, p. 115

Selector Switches

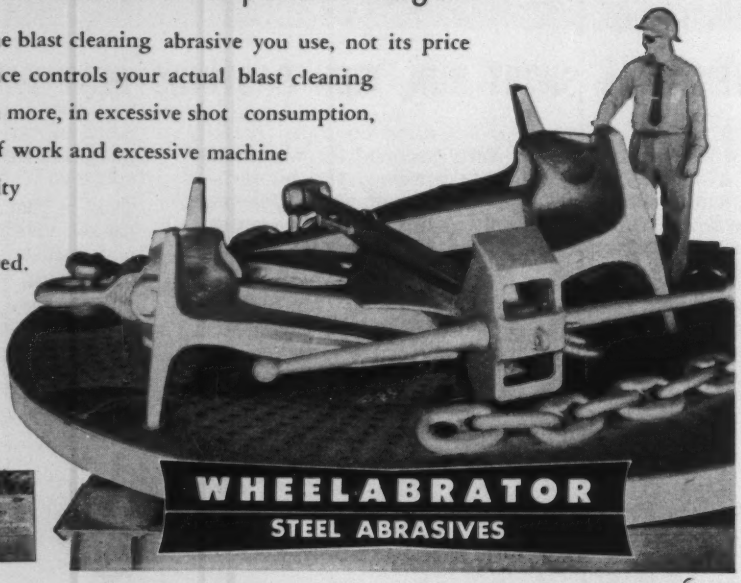
Rotary, key, and push-button selector switches, for thermocouple

EXECUTIVE REPORT #5

DON'T SAVE PENNIES TO LOSE DOLLARS

the lowest-priced abrasive can be an expensive bargain

Your real concern is the *ultimate cost* of the blast cleaning abrasive you use, not its price per ton. Abrasive quality and performance controls your actual blast cleaning costs. Lower priced abrasives can cost you more, in excessive shot consumption, lower production volume, poor quality of work and excessive machine maintenance. In case after case, high quality Wheelabrator Steel Shot has proven to be the *lowest-cost* abrasive, all factors considered.



You can prove the savings you'll make with Wheelabrator Steel Shot

Your Wheelabrator Abrasive Engineer will demonstrate the performance of Wheelabrator Steel Shot in your own plant. For helpful suggestions to get better cleaning at lower cost, write for our new Handbook of Abrasive Performance. Wheelabrator Corp., 510 S. Byrkit St., Mishawaka, Ind. In Canada, P.O. Box 490, Scarborough, Ontario.

and resistance thermometer applications, provide rapid, accurate switching from 1-144 sensing elements. Switches may be used with any type of thermocouple or resistance thermometer, and all measuring instruments. (Thermo Electric Co., Inc.)

For more data circle No. 33 on postcard, p. 115

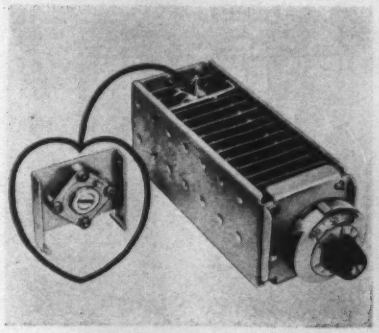
Deburring Compound

Moderate alkalinity with abrasives is combined in a compound that deburrs metals in tumbling barrels. It has no adverse chemical action on metals. Also, the compound often enhances the color of the pieces. It may be used in a range of 4-48 oz per gal of water, at room temperature, and for times varying with the nature of the work. (Oakite Products, Inc.)

For more data circle No. 34 on postcard, p. 115

Rotary Switches

A new line of maintenance-saving, removable-wafer rotary switches handles up to 400 positions. Switching is transferred from 1 wafer to the next by a control unit and its associated control wafer. Maintenance time is almost eliminated because any wafer lifts out instantly without unsoldering or disassembling. This allows fast, simple cleaning or immediate replacement. Any standard multi-position indicating dial can be furnished. (Precision Products Div., Chicago Dynamic Industries, Inc.)



For more data circle No. 35 on postcard, p. 115

Vacuum Gage

A completely mechanical diaphragm gage measures total pressures of all gases from atmosphere to 0.2-mm Hg. The inexpensive gage, designed for installation directly to a vacuum system, requires no electrical connections. Its principle of operation is the deflection of a thin metal diaphragm by a change in pressure. The diaphragm is made of corrugated copper-beryllium to add ruggedness and longer life. By means of a mechanical linkage connected to this diaphragm, a pointer on the front of the gage indicates pressure on a large, easily-read circular scale.

EXECUTIVE REPORT #9

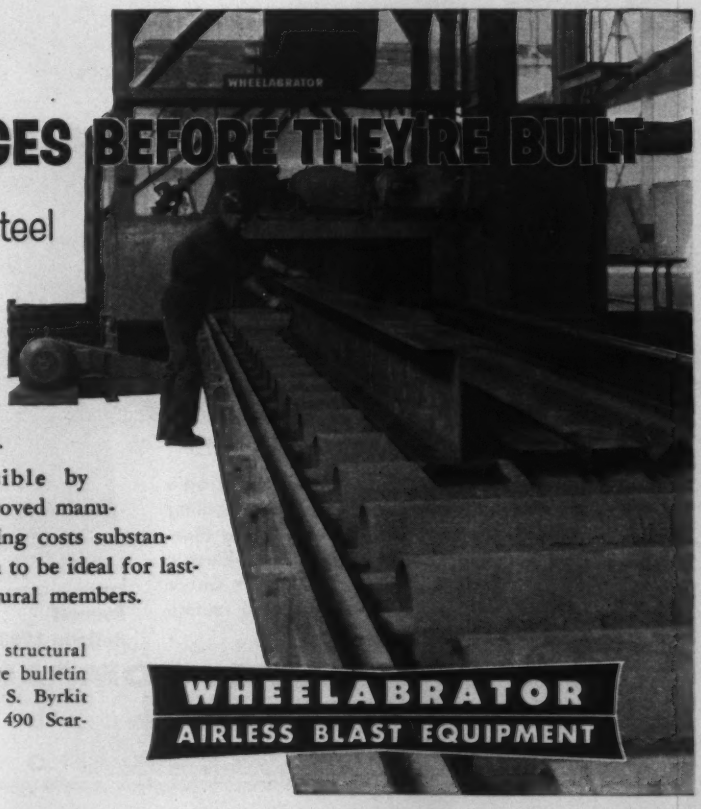
THEY BLAST BRIDGES BEFORE THEY'RE BUILT

Blast Cleaning Structural Steel Provides Big Savings

Prominent structural steel fabricating plants now blast clean all shapes and sizes of structural steel channels, angles, plates, bar and rod stock—in Wheelabrator cabinets.

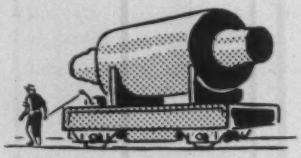
The straight-line production made possible by Wheelabrator airless blast cleaning has improved manufacturing efficiency and reduced their cleaning costs substantially. And the shot-blasted finish has proven to be ideal for lasting surface protection of the finished structural members.

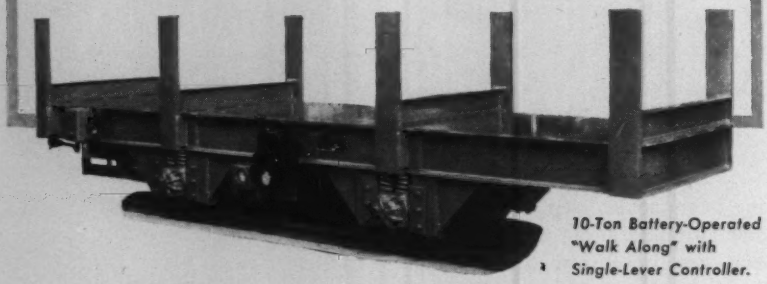
Wheelabrator's unequaled experience in descaling structural steel is at your service. Send for new informative bulletin No. 152-D. Write to Wheelabrator Corp., 510 S. Byrkit Street, Mishawaka, Ind. In Canada, P. O. Box 490 Scarborough, Ont.



WHEELABRATOR
AIRLESS BLAST EQUIPMENT

Safety-type Transfers





10-Ton Battery-Operated "Walk Along" with Single-Lever Controller.

ATLAS "walk-alongs" handle your big loads with BIG savings

Altas Safety-Type Transfers are custom designed in any capacity, with single or double-end platforms or for popular "walk-along" service. Safe because there is only one control lever and the car moves only when the operator holds lever.

Battery Operated Roll Transfer Car

SPECIAL FEATURES . . . Deck and cradle arrangements designed for load-handling convenience. Optional power includes Storage Battery • Gas-Electric • Diesel-Electric • Cable Reel AC • Cable Reel DC • Cable Reel AC with fluid coupling • also remote control with no trailing cable.

Request Bulletin 1283

ATLAS CAR & MFG. COMPANY

1140 IVANHOE ROAD

CLEVELAND 10, OHIO

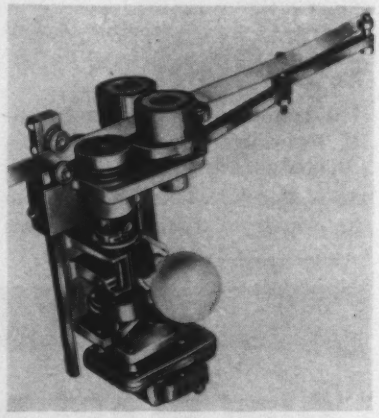
DESIGN DIGEST

This scale is calibrated in millimeters of mercury. The scale has a non-linear calibration which spreads the 0.2-20 mm region over 180° of the circle for greater accuracy. (Consolidated Vacuum Corp.)

For more data circle No. 36 on postcard, p. 115

Machine Stop

"Feed - Off," a completely mechanical, production - proven machine stop, is now available on a nation-wide basis. Rugged and dependable, this device is designed to instantly stop a machine. It's activated if length of stock per stroke drops below a preset minimum; if stock varies in thickness; if defects



such as burrs and tears occur in stock; and when the stock coil-end approaches. Stop action increases die life. It also saves down time and will allow more machines to run at a higher rate of speed with fewer operators in attendance. (Rands Products, Inc.)

For more data circle No. 37 on postcard, p. 115

Electric Clutch Brake

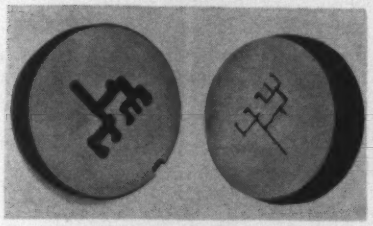
An electric clutch brake, available on a manufacturer's transfer presses, prevents severe and costly damage to tooling and parts. With a conventional mechanical clutch brake, two revolutions occur before complete stoppage. During this time, serious tool damage can result. The new clutch can easily be incorporated into electronic gaging and inspection of parts during production runs. It also allows a single

operator to run several machines at the same time. (The Baird Machine Co.)

For more data circle No. 38 on postcard, p. 115

Tracing Attachments

Automatic milling of reliefs on extrusion dies has been recently developed. A program instituted with the cooperation of Aluminum Corp. of America, has perfected a fast, simple method of producing intricate aluminum dies. The automatic 360° trace machining process



permits constant feed-rate control and the use of coolants. Constant feed control within 5 pct at feeds of 0.2 ipm with 0.04 in. cut can be maintained. A constant rate of 0.125 ipm is possible when cutting with the full diameter of the tool. (Tracer Control Co.)

For more data circle No. 39 on postcard, p. 115

Hot-Cold Chamber

To accommodate both large and small equipment, a 120-cu ft chamber is constructed with removable shelves spaced 12 in. apart. Two full-opening front doors are each provided with one 20 in. square

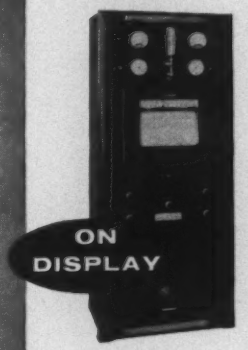
access door and four 6 in. square hand holes for adjustment of equipment within the chamber. Chamber temperatures are adjustable from +300°F to —150°F. Two fin-coil blower assemblies with 2500-w heaters provide both heat and air

A "MUST" FOR YOU AT THE METAL SHOW
BOOTH 1809

ROLOCK®

ATMOSPHERE EQUIPMENT

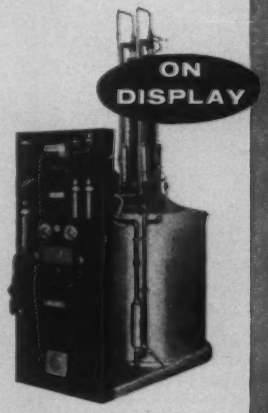
- *NEWEST and most advanced engineering*
- *important NEW aids to quality control*
- *coordinated systems and equipment*



ROLOCK CARBON POTENTIAL CONTROLLER

- Accurately controls carbon potential of furnace atmospheres (not by dewpoint).
- Immediate and constant response.
- Precise and dependable control.
- Minimum maintenance.
- Specially trained operators not required.

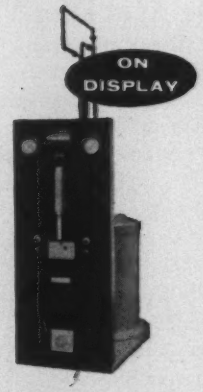
U.S. Patent No. 2,818,246 (Kappel)



ROLOCK ENDOTHERMIC GAS GENERATOR

- Complete reversibility and self-cleaning of catalyst beds.
- Precise gas-air metering and mixing.
- Dual Catalyst chambers...complete cracking.
- Triple cooling effect prevents reverse action.
- Compact, easily installed "packaged" unit.

U.S. Patent No. 2,802,725 (Kappel)



ROLOCK AMMONIA DISSOCIATOR

- Same high standards of efficiency and performance as the Endothermic Gas Generator.
- Addition of propane or natural gas adjusts gas levels for heat treating plain carbon or alloy steels.

For technical literature, write:
ROLOCK INC., 1362 KINGS HIGHWAY, FAIRFIELD, CONN.

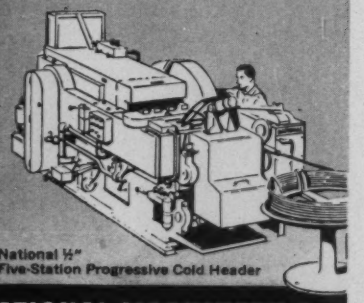
JOB-ENGINEERED for better work
Easier Operation, Lower Cost

4RL60

These important parts are cold-formed from wire, start to finish in compact, efficient National Cold Headers.

Practically scrapless, all these parts achieve remarkable savings over past methods.

If you make odd-shaped parts, may we help you evaluate them for cold-forming from wire? Better yet, come to Tiffin, witness our demonstrations and let's discuss your work.



National ½" Five-Station Progressive Cold Header

NATIONAL MACHINERY CO.

TIFFIN, OHIO, U.S.A.

HARTFORD DETROIT CHICAGO

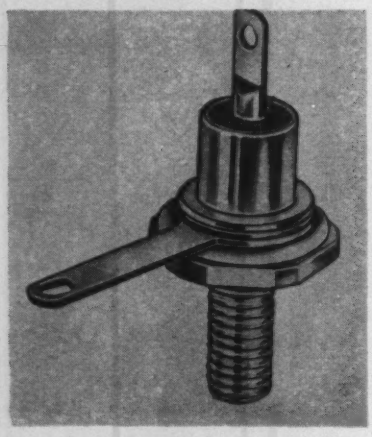
DESIGN DIGEST

circulation. Low temperatures are provided with a refrigeration system. Refrigerant tubes completely surround the chamber for uniform temperature distribution. (Cincinnati Sub Zero Products)

For more data circle No. 40 on postcard, p. 115

Power Rectifiers

Military-type silicon rectifiers are rated at 5 amp continuous dc at 150°C case temperature and at 600 v. At rated current the forward drop is 1.2 v maximum. Reverse leakage



is 4 amp at 25°C and 500 amp at 150°C. Surge current rating is 150 amp for 1/120 of a second for a 60 cps sine wave. (Bradley Semiconductor Corp.)

For more data circle No. 41 on postcard, p. 115

Mobile Stacking Valve

Solenoid operation and extreme adaptability are application features of a new 25-gpm four-way separate segment stackable valve. Stacked assemblies can include relief valves and pilot pressure control valves. This valve can be furnished for ac or dc solenoid, remote pilot, manual or mechanical control. A built-in flow feature allows independent adjustment of cylinder speeds in either direction. (Racine Hydraulics & Machinery, Inc.)

For more data circle No. 42 on postcard, p. 115

High-Temperature Nut

Added performance and reliability in high-temperature applications are provided by a new 1000°F, 145,000-psi self-locking nut. This featherweight locknut exceeds tensile strength, maximum usage temperature, magnetic permeability and locking torque requirements of the aerospace industry's NAS 1291C nut standard. In addition, it is said to be the lightest locknut available for its rated strength and temperature. (Standard Pressed Steel Co.)

For more data circle No. 43 on postcard, p. 115

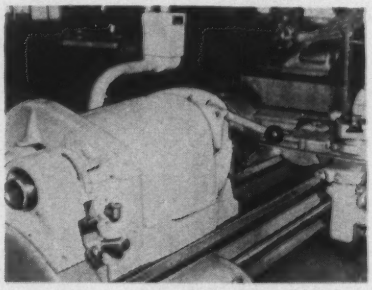
Isolate Vibrations

Effective isolation of vibrations, caused by machinery with high operating speeds and disturbing frequencies of 350 cps and higher, is assured by a new series of spring mountings, with average static deflections of 1 in. Designed for use in applications where horizontal thrust is not severe, a choice of load capacities from 25 to 15,600 lb per mounting is offered. Four types handle any conceivable mounting condition. (Vibration Mountings, Inc.)

For more data circle No. 44 on postcard, p. 115

Lathe Brake

A 13-in. turret lathe has a new, low-cost, manually operated, friction spindle brake that also disconnects power to the lathe motor when the brake is applied. Also available



on 13-in. engine and toolroom lathes, this new brake can be obtained for installation on lathes now in use. (South Bend Lathe, Inc.)

For more data circle No. 45 on postcard, p. 115

Tap and Drill Coolant

Containing no carbon tetrachloride or ether, a coolant is specially designed for use on fine precision drilling and tapping of all hard-to-work metals. The tap and drill coolant is recommended for use on 2000 to 20,000th drill, jeweler's

IDEAL SPECIFIES KEYSTONE WIRE FOR WIRE CONNECTORS

"We use Keystone MB Spring Wire because we know our spring coils will meet rigid specifications. That is the secret of the success of our solderless wire connectors," says Paul Cherry, Plant Superintendent of Ideal Industries, Inc., at the Petersburg, Illinois, plant.

Ideal Industries were the original designers and manufacturers of wire connectors for electric wiring in appliances and home construction. Their "Wire-Nut"* connector with a copper-coated conical spring, securely contained in a plastic cone, is the standard for electrical contractors the world over.

Ideal, a major supplier to world markets, emphasizes quality control by continuous inspection of their tiny wire spring coils.

Keystone's metallurgical and research engineers worked closely with Ideal Industries, Inc., to develop a special MB Spring Wire for its product. Close diameter tolerance, uniform temper throughout the coil, special surface for copper and cadmium plating and lubricant qualities for high-speed production were the results of this research effort.

Delivery is made in moisture-proof fiber drums for protection of plating quality finish during shipment or storage.

Take a cue from Ideal Industries and let Keystone solve your wire problems. Call your Keystone Wire Representative soon or write us for details; we will be pleased to help you.

Keystone Steel & Wire Company, Peoria 7, Illinois

KEYSTONE

WIRE FOR INDUSTRY

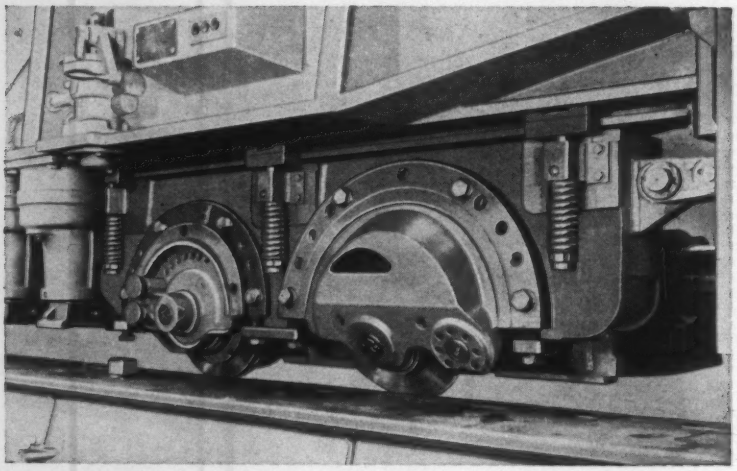
*Reg. TM Ideal Industries, Inc.

A Completely New Method Of Heavy Duty Shearing

by

SCHULZE & NAUMANN

Roller Shears



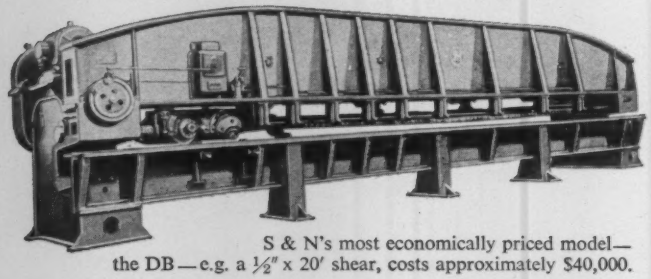
Close-up of carriage with shearing rollers for straight and bevel cut

Schulze and Naumann Roller Shears bring you an entirely new concept of heavy duty shearing—providing tremendous improvements in accuracy, quality of cut, speed and economy over older, flame cutting methods. Most models can even be built as combined shear and plate edge planers.

Shearing Principle. Plates are sheared between a lower knife and an upper roller shear. A powerfully driven carriage carries two shearing heads, one for straight and one for bevel cuts.

Strip Cutting. Positive "hold-downs" permit strip to be cut free of camber, twist or bow on the S&N double bed shears.

Planing. Powerful planing equipment can be added to produce, for example, double vees or profiled edges. Planing capacity can be much larger than shearing capacity.



S & N's most economically priced model—the DB—e.g. a ½" x 20' shear, costs approximately $40,000.

Capacity. Plates from ¼" x 20' to 1½" x 55', or even larger, are sheared in one setting.

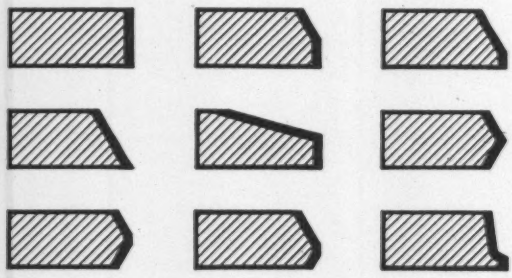
Accuracy. Extremely rigid design and powerful, positive hold-downs guarantee cuts of unequalled accuracy and quality.

Speed. Shearing speeds up to 112 feet per minute are possible. An S&N Shear will cut a greater total length in one day than any other method.

Versatility. Any type of edge preparation is possible, including straight, beveled or combined cuts.

Five different models to suit your needs.

EDGES PRODUCED ON S & N ROLLER SHEARS



Write for more information

COSA

Importers of Leading Precision Machine Tools
Nationwide Sales and Service
COSA CORPORATION, 405 LEXINGTON AVENUE, NEW YORK 17, N.Y.

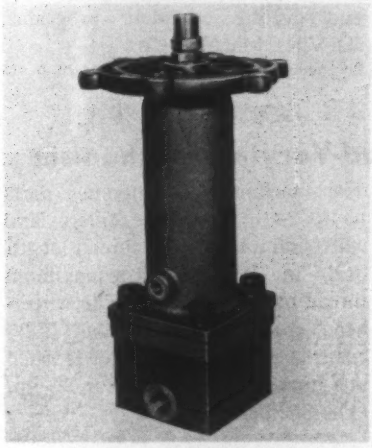
IN CANADA—COSA CORPORATION OF CANADA LTD., 1160 Lakeshore Road, Long Branch, Toronto 14, Ontario

drill, press work, fine tapping and drilling. (Fine Organics, Inc.)

For more data circle No. 46 on postcard, p. 115

Relief Valve

A pressure-reducing and relief valve operates at initial pressures of 4000 psi with water, oil or gas. The valve, constructed of heat-treated aluminum bar stock with bronze and monel trim, is available in ½- and ¾-in. sizes. It is used to supply a process or piece of equipment



that requires small capacity—or a small unit under test with pressures within 2-3 psi over the entire adjustable range. The single-seated, spring-loaded, diaphragm-actuated valve has adjustable pressure ranges of 0-1000, 0-2000 and 0-3500 psi. (Atlas Valve Co.)

For more data circle No. 47 on postcard, p. 115

Locks Nuts to Bolts

A new liquid plastic locks ordinary threaded fasteners securely. No amount of vibration can shake them loose. They can be removed with ordinary tools. Machinery designed for higher operating speeds, and parts subjected to increased levels of vibration, can now be made more reliable through the use of this method of lock fastening. A single drop applied to a tightened nut will wick its way into the threads, harden and lock the nut on to stay. (American Sealants Co.)

For more data circle No. 48 on postcard, p. 115

SILENT HOIST

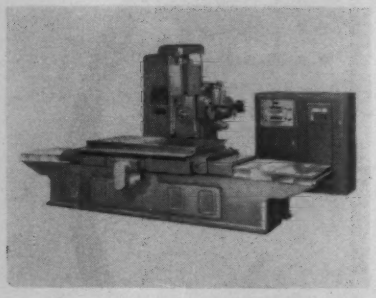
sets the pace again...

360° BOOM SWING—*Now . . . another addition to the famous family of Silent Hoist* **KRANE KAR** *. . . the original Mobile Swing Boom Crane!* **BOOM ROTATION:** *All-Hydraulic 360° continual rotation on heavy-duty double-race ball-bearing turntable.* **BOOM:** *15/22 ft., manual or hydraulic telescoping.* **TRANSMISSION:** *Hydraulic power shift directional in combination with flywheel torque converter.* **STEERING:** *Full time power steering, finger-tip control.* **ENGINE:** *Heavy duty 6 cylinder valve-in head type.* **BOOM TOPPING:** *Horizontal to highest vertical in only 8 seconds.* **BOOM HOISTING:** *Load block 3 parts of line 25 to 55 fpm.* **TIRES:** *Dual pneumatic tires on traction axle for high flotation and extra blow-out protection.* **TOTAL VISION AND SAFETY:** *No obstruction in any position of load or crane; operator fully protected through 360° rotation of boom. Write for complete details in illustrated bulletin #99.*

180° BOOM SWING—*The Standard widely favored All-Hydraulic or Mechanical 180° swing boom crane models. Lifts, carries, and places any load up to 12½ tons. One engine powers the machine for travel and all crane applications—finger-tip control. Front traction wheel drive supports chassis and crane load. 2 geared speeds for hoisting, topping, and swinging. No tail swing—Boom never passes over Operator's head. Write for complete details in illustrated bulletin #79.*

SILENT HOIST & CRANE CO.
BROOKLYN 20, N. Y.

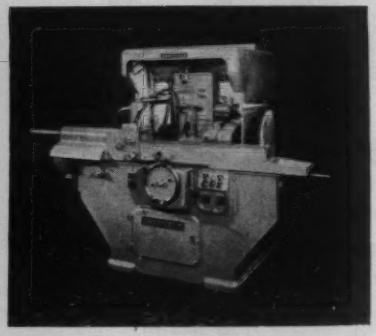
New Equipment and Machinery



Jig Mill Offers Greater Range and Easy Operation

Spindle sizes ranging from 3-5 in. greatly increase the jig mill's range for precision boring, milling, drilling and other operations. The features incorporated into the rugged machine include: simplified controls and thermal control of main spindle bearings, for increased accuracy; wider bed and table for added stability and working range. In operation with the jig mill is a system of automatic tape control. It is a point-to-point system for automatic measuring, positioning and cycling complete programs. (DeVlieg Machine Co.)

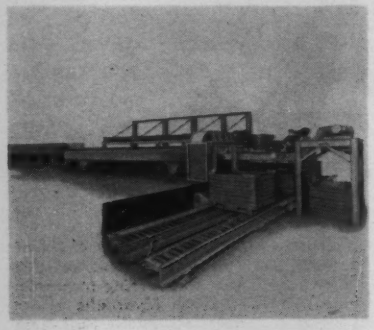
For more data circle No. 49 on postcard, p. 115



Precision Grinder Has Lead-Varying Mechanism

Plunge or traverse grinding of precision threads and worms, and grinding cylindrical forms, is the work of a thread and form grinder. Change gears are provided for all standard U. S. pitches, 8-60 inclusive. Threads and worms are plunge ground in a turn and a half of the work with a dressed multi-rib wheel. The machine accommodates parts up to 24 in. between centers, and will grind a maximum thread length of 14 in. It will grind a maximum thread diameter of 3 in. The wheelhead speeds are 1750 and 2000 rpm. The wheelhead motor is rated at 5 hp; the workhead motor, ⅓ hp. (The Sheffield Corp.)

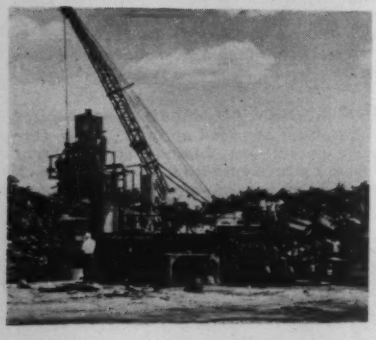
For more data circle No. 50 on postcard, p. 115



Bar-Handling System is Fully Automated

An automated material-handling system, for a bar-shear, consists of a bar feeding system, a bar takeaway system, a container loading system and a container handling system. The feeding system, a hopper-type live roll conveyor, receives bundles of bars or tubes from an overhead crane, outdoors. A conveyor brings the bundles indoors. A device then unscrambles the bundles and conveys individual bars transversely onto a conveyor, thence to a shear. The takeaway system consists of a conveyor which takes the cut bars away from the shear and loads them into a container. The full container is then replaced. (Spurgeon Co.)

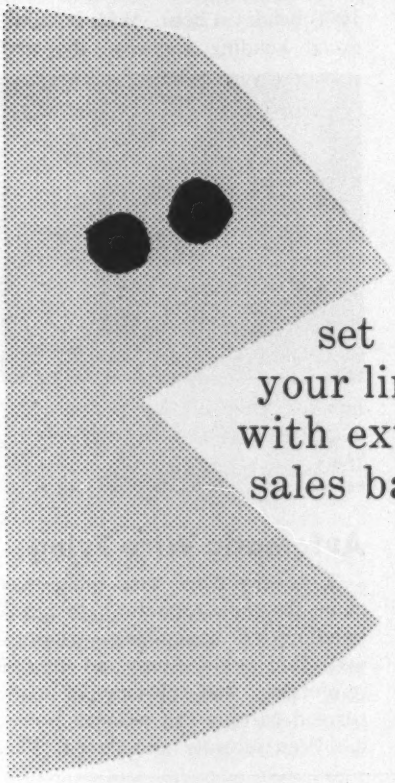
For more data circle No. 51 on postcard, p. 115



Scrap Shear Cuts Scrap in Varying Lengths

With a 350-ton capacity, a vibratory - conveyor scrap shear automatically prepares up to 100 tons of scrap per day. A vibratory conveyor charging box moves scrap between the shear knives in increments of 6 in. This shear changes scrap reduction from a hand operation to an automatic method. Once turned on, the shear runs indefinitely without an operator. The crane operator keeps the charging conveyor filled with rough scrap. He also superintends the shear and changes settings for desired prepared scrap dimensions when required. A user estimates an $8.00 per ton saving over previous methods. (U. S. Industries, Inc.)

For more data circle No. 52 on postcard, p. 115



• specify • specify

set your line with extra sales bait

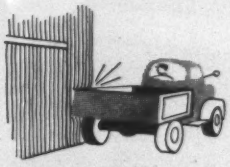
TI-CO® NON-FLAKING GALVANIZED SHEETS

for DURABILITY

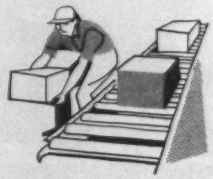
Tough, strong, corrosion-resistant . . . that's Inland TI-CO . . . the non-flaking galvanized sheet with the rugged coating plus the inherent strength of steel. ■ Easy formability, too. Deep-draw, spin, punch, crimp, Pittsburgh lock-seam —work TI-CO to the very limit of the base metal—and you'll never have a chipping, peeling, cracking or flaking problem. ■ That's why manufacturers of products calling for endurance under roughest treatment—buildings, conveyors, chutes, siding, highway guard rails—use TI-CO to add "sales bait" to their product line.

INLAND STEEL COMPANY 30 West Monroe Street • Chicago 3, Illinois Sales Offices: *Chicago • Davenport • Detroit*
Houston • Indianapolis • Kansas City • Milwaukee • New York • St. Louis • St. Paul

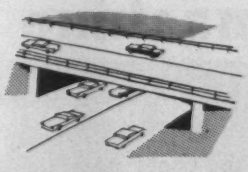
INLAND



Farm buildings made from non-flaking TI-CO maintain corrosion-resisting coating under toughest abuse.



Though subjected to constant abrasive action, TI-CO adds years of service to this roller conveyor.

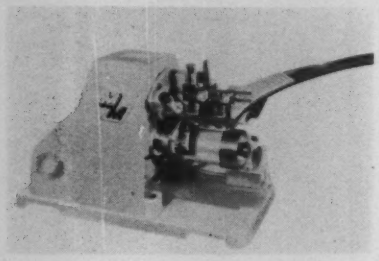


Denting, scratching, weathering won't stop the protection of highway guard rails afforded by TI-CO.

NEW EQUIPMENT

Marking Machine

Tapered objects of plastic, metal and glass can be marked at speeds up to 100 per minute by an automatic imprinting machine. Completely automatic feeding, imprinting and ejection make this machine ideal for bench mounting in a production line. Objects up to 2¼-



in. diam are automatically fed from a curved chute magazine into the self-contained printing mechanism. Durable imprints are applied. Short run marking is made practical by the flexibility of this machine in adjusting to objects of various sizes, and the use of quick-change type inserts. Individual lot or control numbers, for example, may be inserted without changing the printing plate. (Markem Machine Co.)

For more data circle No. 53 on postcard, p. 115

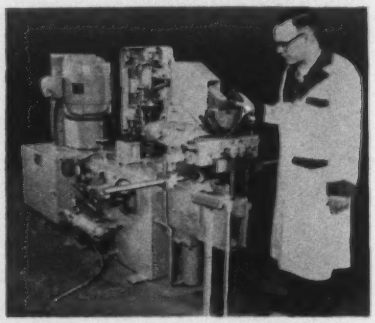
Rust Remover

A new rust remover, improved with chemical additives, is now being tested by hundreds of manufacturers, processors and institutions where rust and corrosion are a hazard. This improved chemical solution, known as Cor-O-dex, may be applied to any metal surface by brush, spray gun, cloth or immersion. It's effective on iron, steel, stainless steel, brass, bronze, copper, nickel and aluminum. (Allied Products Co.)

For more data circle No. 54 on postcard, p. 115

Bending Press

Handling tubular or certain structural shaped stock, a bending press gives higher production potentials. The bending press is a unit that increases production 25-50 pct by bending two tubes with each stroke. When handling two tubes at once, the press is rated at 900 strokes or 1800 bends an hour. With its additional bending capacity, the unit



handles jobs in the heavier and larger areas. (Pines Engineering Co., Inc.)

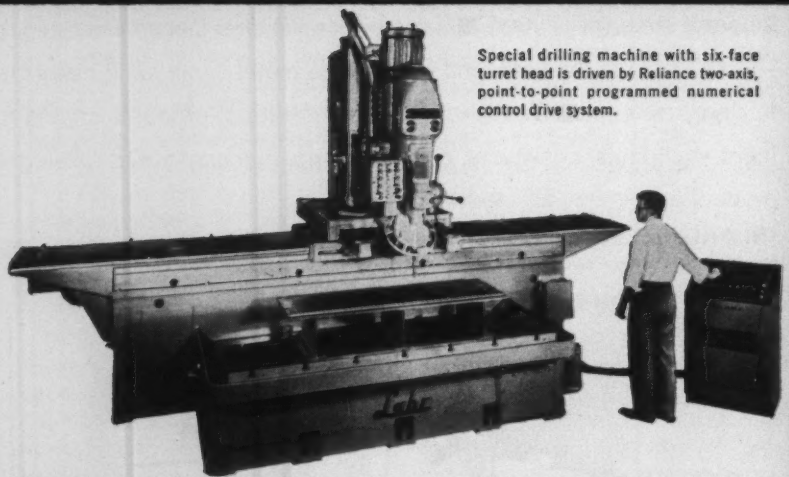
For more data circle No. 55 on postcard, p. 115

Automatic Wire Tying

A conveyor-fed wire tying machine for the automatic high-speed bundling of newspapers, catalogs and other publications, and for the reinforcing and closure of corrugated cartons and wooden boxes has been recently announced. The

RELIANCE PROGRAMMED NUMERICAL CONTROL

a complete system for automatic positioning of machine tools



Special drilling machine with six-face turret head is driven by Reliance two-axis, point-to-point programmed numerical control drive system.

Cutting the costs of lead time and expensive tooling, as well as maintaining high accuracy, Reliance Programmed Numerical Control brings to industry a complete, engineered positioning system. Using resolvers, or resolvers with scales and sliders, extremely accurate position information is compared with the numerical input, and the difference used to drive the positioning motors.

machine uses 13- to 18-gage round steel strapping. It can make up to 26 ties a minute with a 3½ twist tie. It handles packages from 2 to 23 in. high and 8 to 36½ in. wide. (A. J. Gerrard & Co.)

For more data circle No. 56 on postcard, p. 115

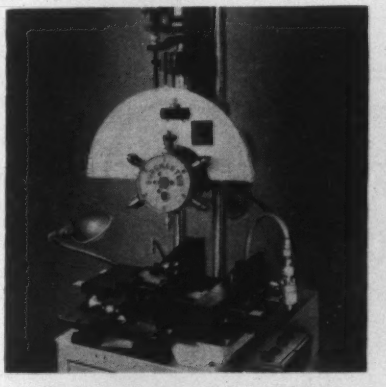
Insulating Tapes

A new line of self-adhering, unsupported silicone-rubber-insulating tapes features triangular cross sections. This permits them to be readily wound on irregular shapes. Each tape is as thick at its apex as the required total insulation thickness. When wrapped in overlapping halves, the tapes give smooth, even external surfaces. A colored center line guides the wrapping and overlapping. (Continental-Diamond Fibre Corp.)

For more data circle No. 57 on postcard, p. 115

Automatic Turret Drill

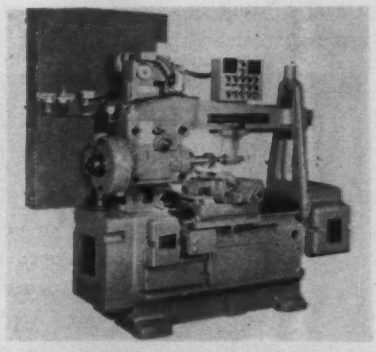
A combination unit speeds precision drilling operations and greatly reduces tooling costs by eliminating box fixtures and jigs. This new bench-model automatic 6-spindle turret drill with power feed is synchronized to the controls of an accessory manual-positioning table. It rapidly locates hole centers within 0.0005 in. The turret drill serves in operations such as drilling, reaming, tapping, etc. (Burgmaster Corp.)



For more data circle No. 58 on postcard, p. 115

Hobbing Machine

Standard-type hobbing machines, on which all functions of the hob carriage and workslide are controlled automatically, introduce new economies for both high-volume and job-lot production of gears and splines. With three different pre-



The Reliance drive provides fast, high accuracy positioning by operating the motors at high speed until the final position is approached. The motors are then slowed down in proportion to the distance from the programmed point, stopping at the exact position. Any number of linear or rotary motions can be controlled simultaneously or individually for completely automatic operation. Provision can also be made for auxiliary functions such as turret selection, clamping, and coolant control.

Reliance Programmed Numerical Control utilizes 8 channel tape or dial selector switches for input. Numerical indicator tubes can be provided for readout.

Here is what you get when you buy Reliance:

- Absolute system—operates from zero reference with no cumulative error.
- Positions from either direction.
- Uses standard machine tool tape, with standard tape processing and reading equipment.
- High Accuracy—electrical accuracy of ± .0001 inch and repeatability of .00001 inch can be achieved.
- Powered by Reliance Super "T" D-c. servo motors . . . small diameter, low inertia, dynamic response.

Reliance systems are of industrial construction, and are sold and serviced by a nationwide organization. For more productive machine time, for greater machine utilization, you'll want to know the complete facts about Reliance Programmed Numerical Control. Call your nearest Reliance Sales Engineer, or write direct.

See the Reliance Numerical Control in operation at the Production Engineering Show, Navy Pier, Chicago, Ill., Sept. 6-16, Booth 411-417

D-1678

Product of the combined resources of Reliance Electric and Engineering Company and its Master and Reeves Divisions

RELIANCE ELECTRIC AND ENGINEERING CO.

DEPT. 29A, CLEVELAND 17, OHIO

Canadian Division: Toronto, Ontario

Sales Offices and Distributors in Principal Cities

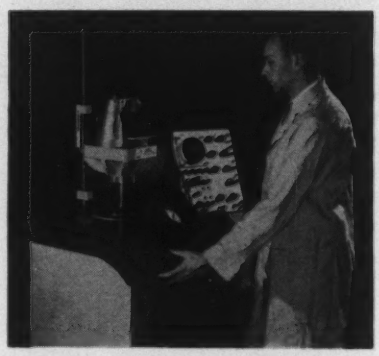
Duty Master A-c. Motors, Master Gearmotors, Reeves Drives, V★S Drives, Super 'T' D-c. Motors, Generators, Controls and Engineered Drive Systems.

selected work cycles, the machines have power vertical feed, which permits hobbing worm gears in addition to the usual range of spur and helical gears and splines. Power feed in both the horizontal and vertical axes can often substantially reduce the approach which often accounts for a high percentage of the total time required to produce a gear. Result is a greater number of productive minutes out of every hour of running time. (Barber-Colman Co.)

For more data circle No. 59 on postcard, p. 115

Shock Tester

A pneumatic-powered shock tester handles production testing of small electronic components and produces up to 3000 g's. The machine handles specimen loads up to 30 lb and produces all shock pulses required for testing electronic parts with an impact-shock velocity of up to 192 ips. This includes the 3000 g, 0.2-millisecond shock pulse required by MIL-S-19500B. Design of the new unit represents a departure from customary free-fall



shock machines in that it employs pneumatic actuation and control of the shock pulses produced. (Industrial Products Div., Avco Research and Development)

For more data circle No. 60 on postcard, p. 115

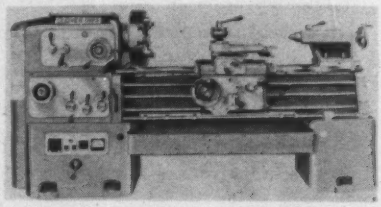
Burnishing Compound

A new soap compound has been developed for burnishing stainless steel and aluminum. The new material is absolutely neutral. It is claimed that it imparts better color and luster than do ordinary compounds. (Tumb-L-Matic, Inc.)

For more data circle No. 61 on postcard, p. 115

Heavy Lathe

With 60 in. between centers, a heavy lathe features a 7-hp motor, an all-geared headstock, 3 bearing spindles and spindle control by double-multidisc clutch—combined with electromagnetic brake. Spindle speeds are from 400 to 2450 rpm. The lathe has a totally enclosed

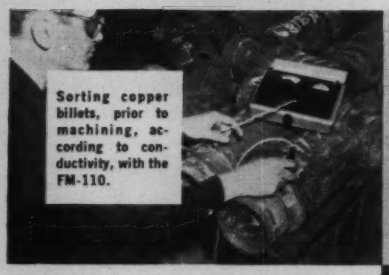


quick-change gear box, a coarse-thread attachment and a fourth bar with 5 longitudinal stops. It also makes use of automatic cross stops and a tailstock with a graduated quill. The latter is equipped with a magnifying glass. The headstock and the tailstock both contain tool

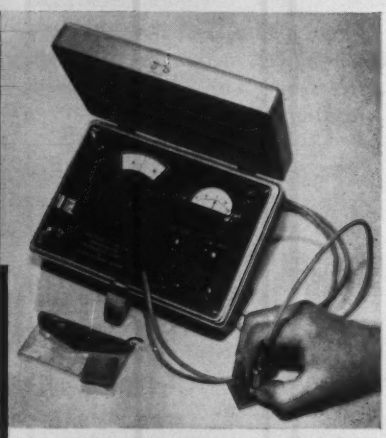
New fully portable ALL-TRANSISTORIZED BATTERY-POWERED

ELECTRICAL CONDUCTIVITY METER

Now you can use conductivity instantly to measure hardness, alloy content, sort mixed materials,— on practically ANY NONMAGNETIC METAL.



Sorting copper billets, prior to machining, according to conductivity, with the FM-110.



the MAGNATEST* FM-110

$875.00 Complete

F. O. B. our plant, Chicago. Local sales or use tax extra. Continental U.S.A. and Hawaii only. Price subject to change.

- Weighs only 4½ lbs.
- Accuracy proved in service to better than ±3% of scale reading.
- Operates up to 350 hours or more on two flashlight batteries.

Use on:

ALUMINUM
STAINLESS STEEL • COPPER • MAGNESIUM • BRASS • BRONZE • LEAD • SILVER or other nonmagnetic metals . . .
• INGOTS • SHEETS • BARS
• FINISHED PARTS

EVALUATE material alloy, hardness, uniformity of heat treat, as directly rated to conductivity

SORT mixed nonmagnetic metals

MEASURE ABSOLUTE CONDUCTIVITY of electrical hardware and components

CHECK AGING OF ALUMINUM ALLOYS — 100% at high speed

TEST TENSILE STRENGTH OF aluminum by conductivity

MEASURE COATING THICKNESS and clad side of sheets

ALSO TO: determine phosphorous content in copper, measure thermal conductivity as function of electrical conductivity, detect fire damage to aircraft surfaces and structures by change in conductivity in heat-affected zones.

New, practical, money-saving uses for the FM-110 are being found continuously. Where can it help you? Phone our local field engineer or write Magnaflux Corporation, 7302 W. Lawrence Ave., Chicago 31, Ill.

*Magnatest is a registered U.S. Patent Office trade mark of Magnaflux Corporation for its electrical instruments for testing metallic and conductive objects. THE FM-110 is based upon designs of Institut Dr. Foerster, Reutlingen, Germany.

MAGNAFLUX CORPORATION

A SUBSIDIARY OF GENERAL MILLS

General Mills

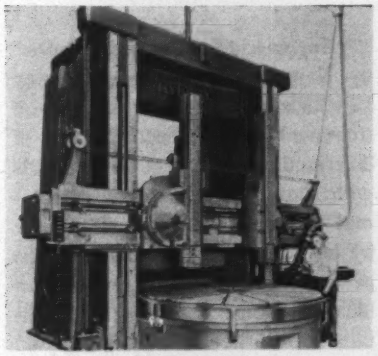
TEST SYSTEMS

trays. Automatic force-feed lubrication is provided to the headstock, apron and bedways. (Hermes Machine Tool Co., Inc.)

For more data circle No. 62 on postcard, p. 115

Vertical Boring Mill

An 8-ft vertical boring mill, with a roller-bearing table track, has complete remote pendent control and an electronic readout measuring system. An anti-friction table track and a preloaded center bearing effectively reduce heat buildup so that workpieces can be run continuously without loss of accuracy.

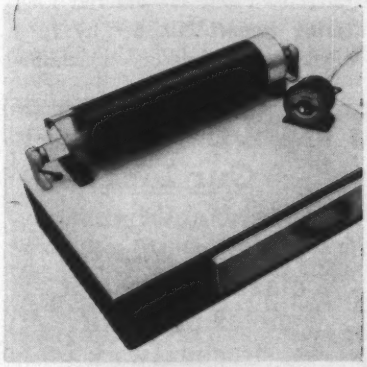


Efficient operation at increased speeds permits full use of carbide and ceramic tools and makes this vertical boring mill a significant cost-reduction tool for production and job shops alike. (Giddings & Lewis Machine Tool Co.)

For more data circle No. 63 on postcard, p. 115

Duplicating Machine

Duplicating with a new machine is a simple, two-step operation. There is no negative. The machine



makes accurate, clear copies directly from the original. Since it develops by the dry process, there are no chemicals to mix, no messy trays, and no drying problems for the finished copy. The machine measures only 20-in. long, 10-in. wide, and 9-in. high. It weighs less than 15 lb and can be carried easily. It plugs into any standard 110-v ac outlet. (Copymaker Co.)

For more data circle No. 64 on postcard, p. 115

Stencil Cutting

A broader scope of uses for stencil-letter applications is now possible by using stencil-cutting machines that cut characters in non-standard sizes. Machines are available to cut ⅛-, ⅜-, 2- and 3-in. characters. (Diagraph-Bradley Industries, Inc.)

For more data circle No. 65 on postcard, p. 115

Prevents Corrosion

Condensation on cold pipes and other surfaces causes dripping and wet surfaces which in turn can cause corrosion. An easy-to-apply coating, which dries to a rock-hard, off-white film, prevents condensation by a two-way action: surface in-

ERIE Bolts • Studs • Cap Screws • Nuts
In Alloys • Stainless • Carbon • Bronze

Sharp eyes, made sharper by scientific instruments, verify microscopic details of thread accuracy at Erie Bolt & Nut Company. This is but one proof of the painstaking craftsmanship your own fastener specifications receive from the hands of Erie specialists. Fasteners to resist corrosion, extremes in temperature and tensile stresses to your specifications have been our exclusive job for almost half a century.
Send us your specifications for prompt estimate.

A SUBSIDIARY OF
REPUBLIC INDUSTRIAL CORPORATION

ERIE BOLT & NUT CO.
Erie, Pennsylvania
Representatives In Principal Cities

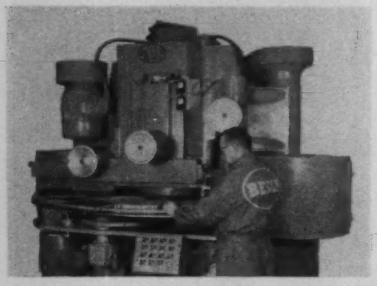
NEW EQUIPMENT

sulation; and absorption of small amounts of moisture followed by later release as the humidity drops. It can be applied to practically any metal or building material by brushing or spraying. (Chemical Concentrates).

For more data circle No. 66 on postcard, p. 115

Versatile Grinder

An adaptable machine grinds the parallel ends of coil springs. It is designed to have additional heads which can be added for multiple-



grinding operations. Abrasive discs and tooling can also be easily and quickly changed. (Besly - Welles Corp.)

For more data circle No. 67 on postcard, p. 115

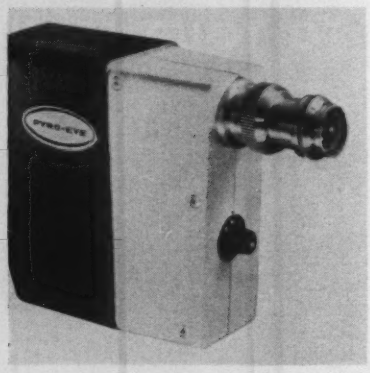
Blooming Mill

Key unit in a new 100,000-ton-per-year, electric-furnace steel plant, recently completed by a builder of heavy equipment, is a new 90-in. high-lift blooming mill. This mill is also used to roll rounds. The mill is capable of reducing ingots as heavy as 15,000 lb to blooms as small as 5⅜ x 6¾-in. cross section. When rounds are being rolled, 14 x 14-in. blooms are reheated in the plant's soaking pits, and reduced to diameters as small as 6-in. in a series of passes back and forth through the mill. (Rolling Mill Div., E. W. Bliss Co.)

For more data circle No. 68 on postcard, p. 115

Optical Pyrometer

A dual-color optical pyrometer provides completely automatic, continuous, measurement and control of temperatures in the range from 1400° to 4500°F and from 750° to 2500°C. It is available in two models: one is for fixed mounting in production areas; the other is portable for laboratory use. Each of these models may be obtained with single, double or triple ranges.



They measure temperatures at any distance from 20 in. to 60 ft from the target and are applicable to a wide variety of industries and processes. These include: continuous casting, hot forming, vacuum melting, hardening, forging, semi-conductor crystal growing, glass, ceramics and refractories. (Instrument Development Laboratories, Inc.)

For more data circle No. 69 on postcard, p. 115

NEW BOOKS

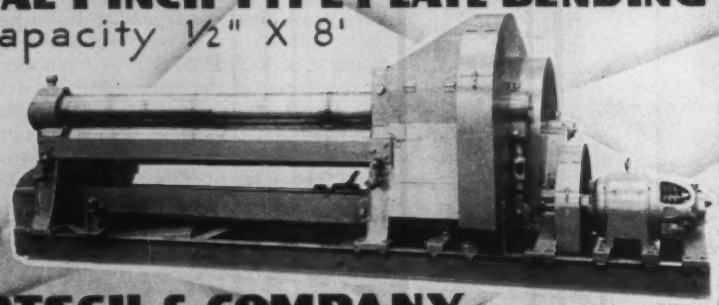
"Quality Control of Hot-Dip Galvanizing," presents information on the problem of how to distinguish good galvanizing. In handy pocket size, the booklet emphasizes the characteristics and benefits of good galvanizing by disclosing the identity of poor galvanizing practice. 40 pages. $1.00 each. Midwest Job Galvanizers Assn., Inc., Box 72, Chicago 50.

"Engineering Thermodynamics," by Newman A. Hall and Warren E. Ibele, contains a substantial treatment of the Second Law of Thermodynamics. The book deals with such complex groups of thermal phenomena as energy transfer by heat, phase equilibrium and the general behavior of gases in non-ideal solutions. The book also contains up-to-the-minute findings on the properties of solids and magnetic fields as well as fluid substances. It fully describes states of matter, molecular and atomic energy levels, and chemical equilibrium. About 640 pp. $10.50. Prentice-Hall, Inc., Englewood Cliffs, N. J.

"Machining Characteristics of High - Strength Thermal - Resistant Materials: Phase II—Interim Engineering Report No. 6," by L. J. Nowikowski, presents machining

INITIAL PINCH TYPE PLATE BENDING ROLL

Capacity ½" X 8'



Our Line

Light and heavy machinery for all classes of sheet metal, plate and structural work

BERTSCH & COMPANY, CAMBRIDGE CITY • INDIANA

data for 25 high-strength, thermal-resistant alloys. These data appear in a report of Air Force sponsored research. Behavior of all the alloys has been studied during cutting, grinding, turning, milling, tapping and drilling operations. Tables list average power requirements for cutting. Graphs show thrust-force and torque measurements for drilling. Grinding data appear in other graphs and tables. 424 pp. $6.00. United States Dept. of Commerce, Office of Technical Services (report PB 161369), Washington 25, D. C.

"Steelworkers in America," by David Brody, covers the iron and steel industry from the 1890's to 1929. The focus of this study is the steelworkers themselves. Beginning with the growth and modernization of American steel manufacture, the history analyzes the causes of the industry's early labor policies. 303 pages. $5.00 per copy. Harvard University Press, Cambridge 38, Mass.

"Barriers to Creativity," is an aid to the creative engineer and scientist. The booklet outlines the factors that can block creative activity. It tells how these can be recognized and overcome. The booklet covers all the important aspects of "blocking"—from emotional insecurities that can prevent creative thinking, to the more superficial, "work-oriented" blocks that may inhibit creative functioning and undermine the quantity and quality of work produced. $1.50 per copy. Industrial Relations News, Inc., 230 West 41st Street, New York 36.

"Welded Steel Conveyor Pulleys," gives a tabulation of load ratings applicable to standard welded steel conveyor pulleys. It also includes a list of the pulley diameters and pulley face widths, considered standard for the industry. Several pages of data prove helpful to the engineer in the selection of the proper pulleys. 15 pp. $1.00 per copy. Multiple V-Belt Drive & Mechanical Power Transmission Assn., 27 East Monroe Street, Chicago 3.

"How to Chart Data," by Phil Caroll, provides guidance on charting as a tool of better management in areas of work measurement, plant scheduling and control of costs. It explains types of data required for various problems, and shows ways of presenting them in easy-to-analyze form. Methods for using charts, to solve problems involving multi-variables, are a special feature. Also appearing in the book are original charts indicating probable profit or loss resulting from sales of four different products over a range of product mix from $120,000 minimum to $480,000 maximum. 250 pp. $7.50 per copy. McGraw-Hill Book Co., Inc., 327 West 41st Street, New York 36.

The revolutionary Bliss Pulsation Burner

produces temperatures never before achieved with oil or natural gas.Burning oil, it can reach a searing 3450°F. On 1000 BTU/cu. ft. natural gas, it develops 3320°F. Both these extremely high temperatures are close to the theoretical limits for these two fuels. Foundries, smelters, heat treaters and other metal processers have been quick to take advantage of the remarkable combustion efficiency of these new burners. To them, it has meant faster heating cycles, cleaner flue gases, and above all, fuel economy that cuts from 12% to 30% from their furnace overhead. Not to speak of reduced maintenance on refractory linings.

To learn how the Bliss Burner can increase the heat output in your plant while it's saving you money in fuel and furnace maintenance, write today for our Bulletin No. 60. It's yours for the asking.

BLISS
SINCE 1857

E. W. BLISS COMPANY
Canton, Ohio
BLISS is more than a name—it's a guarantee

What's your steel need?

- **Prompt Delivery**
- **Wide Selection**
- **Fabrication**
- **Less Inventory Investment**
- **Storage Space**

Any one or all of these needs can be met by getting in touch with your Steel Service Center. Delivery is usually from stock and you can select exactly the steel you need, because your Steel Service Center stocks many types. Qualified specialists can usually provide just the right answer to your design and fabrication problems.

There are additional benefits. You can save on inventory investment as well as storage space. It will pay you to investigate the services of your nearest Steel Service Center . . . listed in the Classified Telephone Directory.

Alan Wood supplies major Steel Service Centers with high quality plate, sheet and strip.

Steel

ALAN WOOD STEEL COMPANY

Conshohocken, Pa. • STEEL PRODUCERS WITH SERVICE IN MIND

DISTRICT OFFICES AND REPRESENTATIVES: Philadelphia • New York • Los Angeles • Boston • Atlanta
Cincinnati • Cleveland • Detroit • Houston • Pittsburgh • Richmond • St. Paul • San Francisco • Seattle
Montreal, Toronto and Vancouver, Canada — A. C. Leslie & Co., Ltd.

The Iron Age Summary

Automotive Lags, Pickup Slow

With automotive steel buyers playing it cautious, auto steel buying is running 75 to 80 pct behind normal.

Unless there is a big automotive rebound, the recovery is going to be a long, slow process.

■ New steel orders are edging up, but without the support of increased automotive buying. This is about the best that can be said of the current sluggish steel market.

Unless automotive buying picks up, the market is in for a long, slow recovery period with no chance of a sharp upward trend.

Clouded Auto Picture — The automotive steel picture becomes increasingly clouded as automakers begin production of 1961 models without the historical upsurge in steel orders.

Automotive orders now are running about 75 pct to 80 pct of normal for this period.

The sluggishness of the automotive steel market is caused by these factors:

Automotive inventories of steel are abnormally high. This is because the automakers maintained a relatively high level of steel buying throughout the summer and changeover period.

And, the point that has market analysts up in the air: There is a strong feeling that the new models will take from 100 to 500 lb less steel for a 1961 car than for a parallel model in a 1960 series.

This trend, because 1961's tend to be shorter and narrower, compounds the effects of more compacts, now estimated as high as 50 pct (by American Motors' George Romney) of the total market.

Slow Pickup—In addition, August sales were disappointing and automakers are faced with a greater cleanup problem than anticipated. This has made them cautious on their forward buying.

As it stands now, the market for steel is likely to be faced with no stronger pickup than that caused by seasonal improvements and some inventory buildup and balancing.

This is because big users other than automotive show little sign of entering the market in great strength.

Negative — Positive — Here are the negative factors: 1. Oil and gas steel buying is sluggish, and it is a major customer. 2. Warehouse buying is way off. 3. Railroads will not be big buyers as long as their revenues are off.

The few positive points: 1. End of the doldrums for a few users. 2. End of vacations and return to normal production by many users. 3. Low inventories which will lead to buying geared to consumption.

RR Effects—This week's operations will be off because of the Labor Day weekend and the effects of the rash of railroad strikes. Few major steel users felt immediate effects of the Pennsylvania strike, but automakers were hit immediately by the Grand Trunk strike.

For the short term, the railroad troubles will cause temporary dislocations and will put many users in the market for alternate supply sources and emergency transportation measures.

Steel Output, Operating Rates

Production	This Week	Last Week	Month Ago	Year Ago
(Net tons, 000 omitted)	1,425	1,533	1,525	327
Ingot Index				
(1947-1949=100)	88.6	95.4	94.9	20.4
Operating Rates				
North East Coast	50.0	56.0	59.0	12.0†
Buffalo	51.0	58.0	57.0	0.0†
Pittsburgh	40.0	45.0	46.0	25.0†
Youngstown	40.0	44.0	47.0	10.0†
Cleveland	46.0	53.0	49.0	0.0†
Detroit	69.0	71.0	81.0	24.0†
Chicago	59.0	60.0	57.0	5.0†
Cincinnati	55.0	60.0	54.0	69.0†
St. Louis	67.0	73.0	55.0	77.0†
South	57.0	61.0	55.0	10.0†
West	51.0	51.0	47.0	0.0†
U. S. Rate	50.0	53.8	53.5	11.5

*Revised †IRON AGE Estimates

Source: American Iron and Steel Institute

Prices At a Glance

(Cents per lb unless otherwise noted)

	This Week	Week Ago	Month Ago	Year Ago
Composite price				
Finished Steel, base	6.196	6.196	6.196	6.196
Pig Iron (Gross ton)	$66.41	$66.41	$66.41	$66.41
Scrap No. 1 hvy (Gross ton)	$32.50	$32.50	$31.83	$41.17
No. 2 bundles	$22.50	$22.83	$21.50	$27.67
Nonferrous				
Aluminum ingot	26.00	26.00	28.10	26.80
Copper, electrolytic	33.00	33.00	33.00	30.00
Lead, St. Louis	11.80	11.80	11.80	12.80
Magnesium	36.00	36.00	36.00	36.00
Nickel, electrolytic	74.00	74.00	74.00	74.00
Tin, Straits, N. Y.	102.75	102.25	104.625	102.50
Zinc, E. St. Louis	13.00	13.00	13.00	11.00

Adhesive Market Remains Stable

Adhesive makers are looking to a steady market for the remainder of the year.

Increased auto production and construction could help sales in the last few months.

■ Closely paralleling the economic ups and downs of its customer industries, the market outlook for adhesives appears relatively stable in the closing months of 1960.

A continued healthy climate in construction and automobiles, increased housing work and improved steel making activity would favor the adhesives business in the next four months.

Big, New Market — Those most active in the adhesives manufacturer appear very interested in the challenges presented by rockets and missiles. With hopes of opening up a vast new market, they are looking toward this growing industry. But there are problems. A major one: Coming up with an adhesive that can resist extreme heat, cold and pressures. The Air Force itself is checking into an integral fuel tank and cabin pressurization sealant.

The automotive market is not being neglected, however. Tryouts are continuing on ways in which adhesives can take the place of spot welding. For the 1961 model year no great increase in the use of adhesives is expected. A supplier of auto adhesives raised the price of its product slightly in July, reportedly due to increased costs of raw materials and labor.

Potential Growing—Sales of synthetics are moving along well. Epoxies are still a relatively minor part of the market, but their potential is great, especially as greater use of structural applications develops.

Better vinyls are coming to fill the need of the packaging industry for high speed work. The packaging trade is said to be less conscious of price these days and more interested in buying adhesives that will do a top notch job. Greater cost of labor and a need to get as much efficiency as possible out of every single packaging operation is today's foremost consideration. Not too long ago the emphasis was on low cost adhesives.

All Around—Doing very well in today's market are multi-purpose adhesives, standard formula types used in most metalworking applications. They are popular because they keep inventories down and reduce the possibility of choosing the wrong adhesive for a particular job.

Foreign countries are expanding their output and research on adhesives. A Dutch company is turning one out with polymer synthetic resins of high quality. In France a new process, now in the trying-out stage, makes it possible to get aqueous emulsions of butyl rubber. Large plastics firms in Germany are making similar headway.

Advance Warning — American companies which buy foreign machines, however, may be asking for trouble as far as adhesives go. They are being warned that designs of some foreign equipment often require a change in the formulation of adhesives.

Adhesives producers also are looking with interest at new markets in the appliance and plumbing trades. Appliance manufacturers are working on adhesives that will bond cooling coils to metal sheets, which would take the place of welding or soldering.

What appears to be shaping up as a growing interest in plastic piping in plumbing could also be a boon to adhesive suppliers.

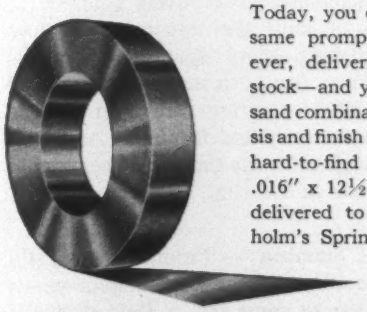
FAST STOP: Chrysler Corp. employees prepare brake lining for a coating of adhesive that adhere the linings to the metal brake shoe backer.

from the GAY NINETIES

to the *Soaring Sixties*

industry has been calling for UDDEHOLM quality spring steels

In the 1890's, when steel fabricators needed spring steels, in special sizes or finishes to meet production requirements exactly, they called for Uddeholm.



Today, you can call Uddeholm for the same prompt, exacting service. However, deliveries are even faster—from stock—and you now have over a thousand combinations of size, temper, analysis and finish from which to choose. Even hard-to-find tempered sizes, such as .016″ x 12½″, in polished blue, can be delivered to you from any of Uddeholm's Spring Steel Service Centers—Newington, Conn., New York City, Cleveland or Los Angeles. A full range of annealed SAE 1075, 1095, and other popular grades including stainless are also readily available. Stock sizes range from 16¼ to ⅛″ wide, and from .125″ to .001″ thick. In addition, at each Service Center, Uddeholm maintains a staff of experienced technical representatives to help you select the right spring steel for your needs.

Modern edge finishing and slitting facilities—a more than 60-year-old reputation for accuracy in size, flatness and finish—guaranteed uniformity of hardness, analysis and fatigue life are your further assurance of satisfaction.

Write Today For Your Free Catalog-Stocklist!

UHB

TOOL AND DIE STEELS
COLD ROLLED SPRING STEELS

UDDEHOLM COMPANY OF AMERICA, INC.

155 East 44th Street, New York 17, N. Y. • MUrray Hill 7-4575

BRANCH OFFICES AND WAREHOUSES

Chicago, Ill. · Cleveland, Ohio · Detroit, Mich. · Los Angeles, Calif. · Newington, Conn. · Philadelphia, Pa.

TOOL STEEL WAREHOUSE DISTRIBUTORS

Rockford, Ill. — Rockford Industrial Steel Service · Utica, N. Y. — Pacemaker Steel and Aluminum Co.

IN CANADA • Uddeholm (Canada) Ltd. • Montreal • Toronto

Will Demand For Galvanized Last?

Automakers are turning to galvanized steel to combat corrosion problems in new cars.

But steelmakers aren't sure the auto industry is convinced it's the final answer.

■ In the past two years demand for galvanized sheet from the auto industry has picked up sharply. The question is: Will it last?

The new compact cars, built with unitized bodies, are the big reason for increased demand. Several of the new cars use galvanized in critical underbody areas as a deterrent to corrosion.

The additional demands from the auto industry have kept galvanized lines operating near capacity—even while overall steel operations have floundered around 50 pct of capacity.

Not Convinced—Now, automakers are placing galvanized steel orders for 1961 cars. The influx of orders has pushed delivery promises out from a few weeks in some districts to a few months. Supply would be even tighter if it weren't for a seasonal decline in construction demand.

Despite an apparently strong market, there are signs that steel companies are wary about expanding galvanizing capacity. For one thing, they aren't entirely sure automakers are convinced that galvanized steel is the answer to their corrosion problems.

And, reason the mills, the $10-$15 million investment in a new line would be down the drain if galvanized should prove to be a flash-in-the-pan.

Sheet and Strip — Steelmakers have been banking on a sharp upturn in flat-rolled orders, particularly from the auto industry, to pull the steel industry out of its slump. The disappointment is evident. Mills are still waiting for the big orders for automakers. At the same time, seasonal declines for tinplate and non-automotive galvanized are beginning to set in. A **Pittsburgh** mill says its automotive order volume is only 75-80 pct of what is considered normal for this time of year. In **Cleveland,** September will be up only slightly from August, and October will only be about 10 pct better. And a **Chicago** mill believes it will be November before automakers begin "normal" ordering. A report from **Detroit** points out that several automakers won't have steel inventories in some sizes down to normal until the end of the year.

Structural and Plate—Consumption of steel for construction is running ahead of last year by about one million tons, according to reports from **Pittsburgh.** With this gain, about 30 pct of the steel used in the U. S. is going into construction. Early forecasts, however, predict a drop in the amount of steel to be used by this market in 1961. Users are still demanding—and getting—fast delivery; often the steel is shipped directly to construction sites.

The amount of foreign structurals entering **East Coast** markets seems to have tapered off. Deliveries are quoted at several months, and prices now run only $10 to $12 under domestic prices. Orders for spot shipments of plate and structurals are starting to show some life in northeastern **Ohio.** And construction is beginning to rank with automotive as one of the more active markets. While actual ordering indicates only a mild upturn, the volume of active inquiries for more tonnage is promising.

Pipe and Tube—Standard pipe continues to lag. One mill says August was only slightly better than July, another mill continues to operate well below 50 pct of capacity in **Pittsburgh.** There has been a slight rise in direct mill shipments of oil country seamless, but overall volume remains down. Warehouses served by **Cleveland** mills are beginning to rebuild inventories a little.

Wire—A mild pickup is beginning to make itself felt by wire mills. Shipments of manufacturers wire for one **Pittsburgh** mill were up 20 pct from June through August. A further improvement is expected in September, but buyers continue to wait until the last minute before placing orders. Some improvements have also been noted by **Cleveland** mills for spring wire used in auto upholstery and furniture. And **Chicago** mills say there has been a mild gain in flat wire.

Stainless — Producers are still waiting for the big automotive orders to come out of **Detroit.** While order rates have been inching upward in **Pittsburgh,** they still haven't shown any real steam. Bright annealing is getting another push. Three more lines will be added to the two already being installed for stainless strip.

PURCHASING AGENTS CHECKLIST

Appliance makers use sales ingenuity to combat market slump from housing slowdown. P. 59

Aluminum producers and machinery makers team up to crack the can market. P. 64

Accurate circular saw cuts nonferrous metals. P. 95

COMPARISON OF PRICES

(Effective Sept. 6, 1960)

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Price changes from previous week are shown by an asterisk (*).

	Sept. 6 1960	Aug. 30 1960	Aug. 2 1960	Sept. 1 1959
Flat-Rolled Steel: (per pound)				
Hot-rolled sheets	5.10¢	5.10¢	5.10¢	5.10¢
Cold-rolled sheets	6.275	6.275	6.275	6.275
Galvanized sheets (10 ga.)	6.875	6.875	6.875	6.875
Hot-rolled strip	5.10	5.10	5.10	5.10
Cold-rolled strip	7.425	7.425	7.425	7.425
Plate	5.30	5.30	5.30	5.30
Plates, wrought iron	14.10	14.10	14.10	13.55
Stainl's C-R strip (No. 302)	52.00	52.00	52.00	52.00
Tin and Terneplate: (per base box)				
Tin plate (1.50 lb.) cokes	$10.65	$10.65	$10.65	$10.65
Tin plates, electro (0.50 lb.)	9.35	9.35	9.35	9.35
Special coated mfg. ternes	9.90	9.90	9.90	9.90
Bars and Shapes: (per pound)				
Merchants bar	5.675¢	5.675¢	5.675¢	5.675¢
Cold finished bar	7.65	7.65	7.65	7.65
Alloy bar	6.725	6.725	6.725	6.725
Structural shapes	5.50	5.50	5.50	5.50
Stainless bars (No. 302)	46.75	46.75	46.75	45.00
Wrought iron bars	14.90	14.90	14.90	14.90
Wires: (per pound)				
Bright wire	8.00¢	8.00¢	8.00¢	8.00¢
Rails: (per 100 lb.)				
Heavy rails	$5.75	$5.75	$5.75	$5.75
Light rails	6.725	6.725	6.725	6.725
Semifinished Steel: (per net ton)				
Rerolling billets	$80.00	$80.00	$80.00	$80.00
Slabs, rerolling	80.00	80.00	80.00	80.00
Forging billets	99.50	99.50	99.50	99.50
Alloys, blooms, billets, slabs	119.00	119.00	119.00	119.00
Wire Rods and Skelp: (per pound)				
Wire rods	6.40¢	6.40¢	6.40¢	6.40¢
Skelp	5.05	5.05	5.05	5.05
Finished Steel Composite: (per pound)				
Base price	6.196¢	6.196¢	6.196¢	6.196¢

	Sept. 6 1960	Aug. 30 1960	Aug. 2 1960	Sept. 1 1959
Pig Iron: (per gross ton)				
Foundry, del'd Phila	$70.57	$70.57	$70.57	$70.57
Foundry, South Cin'ti	73.87	73.87	73.87	73.87
Foundry, Birmingham	62.50	62.50	62.50	62.50
Foundry, Chicago	66.50	66.50	66.50	66.50
Basic, del'd Philadelphia	70.07	70.07	70.07	70.07
Basic, Valley furnace	66.00	66.00	66.00	66.00
Malleable, Chicago	66.50	66.50	66.50	66.50
Malleable, Valley	66.50	66.50	66.50	66.50
Ferromanganese, 74-76 pct Mn, cents per lb‡	11.00	11.00	11.00	12.25
Pig Iron Composite: (per gross ton)				
Pig iron	$66.41	$66.41	$66.41	$66.41
Scrap: (per gross ton)				
No. 1 steel, Pittsburgh	$31.50	$31.50	$30.50	$45.50
No. 1 steel, Phila. area	34.50	34.50	33.50	39.50
No. 1 steel, Chicago	31.50	31.50	31.50	38.50
No. 1 bundles, Detroit	28.50*	29.50	29.50	38.50
Low phos., Youngstown	35.50	35.50	34.50	45.50
No. 1 mach'y cast, Pittsburgh	47.50	47.50	47.50	52.50
No. 1 mach'y cast, Phila.	49.50	49.50	49.50	50.50
No. 1 mach'y cast, Chicago	47.00	47.00	46.50	60.50
Steel Scrap Composite: (per gross ton)				
No. 1 hvy. melting scrap	$32.50	$32.50	$31.83	$41.17
No. 2 bundles	22.50*	22.83	21.50	27.67
Coke, Connelsville: (per net ton at oven)				
Furnace coke, prompt	$14.75-15.50	14.75-15.50	14.75-15.50	14.50-15.50
Foundry coke, prompt	18.50	18.50	18.50	18.50
Nonferrous Metals: (cents per pound to large buyers)				
Copper, electrolytic, Conn.	33.00	33.00	33.00	30.00
Copper, Lake, Conn.	33.00	33.00	33.00	30.00
Tin, Straits, N. Y.	102.75†	102.25	104.625	102.50
Zinc, East St. Louis	13.00	13.00	13.00	11.00
Lead, St. Louis	11.80	11.80	11.80	12.80
Aluminum, ingot	26.00	26.00	28.10	26.80
Nickel, electrolytic	74.00	74.00	74.00	74.00
Magnesium, ingot	36.00	36.00	36.00	36.00
Antimony, Laredo, Tex.	29.50	29.50	29.50	29.50

† Tentative. ‡ Average. ** Revised.

Finished Steel Composite

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold rolled sheets and strips.

Pig Iron Composite

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo and Birmingham.

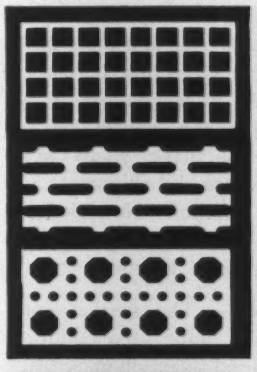
Steel Scrap Composite

Average of No. 1 heavy melting steel scrap and No. 2 bundles delivered to consumers at Pittsburgh, Philadelphia and Chicago.

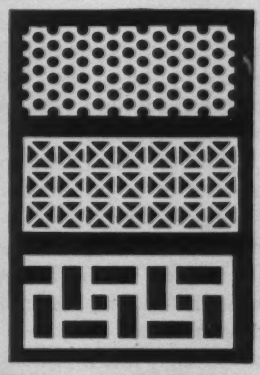
INDEX TO PRICE PAGES

Prices At a Glance 137
Comparison of Prices 141
Bars 148
Billets, Blooms and Slabs 146
Boiler Tubes 152
Clad Steel 152
Coke 151
Electrical Sheets 152
Electrodes 152
Electroplating Supplies 152
Fasteners 150
Ferroalloys*
Iron Ore 150
Merchant Wire Products 150
Metal Powders 152
Nonferrous
Mill Products 145
Primary Prices 141-144-145
Remelted Metals 145
Scrap 145
Piling 146
Pig Iron 150
Pipe and Tubing 151
Plates 148
Rails 152
Refractories 152
Service Center Prices 149
Shapes 146
Sheets 147
Spring Steel 152
Stainless 150
Steel Scrap 143
Strip 146
Structurals 146
Tinplate 147
Tool Steel 150
Track Supplies 152
Water Pipe Index 151
Wire 148
Wire Rod 147

* Appears in the Sept. 1-Sept. 15 issues.



THE *MONEY-SAVING* **ANSWER** to Many Production Problems

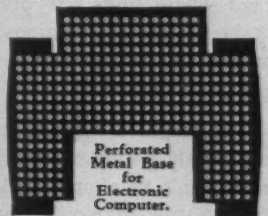


DIAMOND PERFORATED METAL

Sheets • Plates • Panels • Fabricated Parts

For nearly half a century we have supplied America's largest industrial organizations with perforated metal products of all kinds; in lots to meet their production schedules. This procedure not only reduces their inventory costs but, usually, also assures other substantial savings because of our special facilities for producing this type of work efficiently and economically.

Send us YOUR blue prints and specifications. Our experienced engineers are often able to make cost-cutting suggestions without charge or obligation.



We fabricate special panels or parts to any desired extent. Illustrated Catalog on request.

DIAMOND MANUFACTURING CO., WYOMING (Wilkes Barre Area) PENNA.

Rail Strikes Hurt Dealers

A big blow came to dealers in several key areas this week. Rail strikes have paralyzed scrap action in Pittsburgh and slowed other cities.

The overall market leans toward softness. Nevertheless, New York and Boston dealers gain ground.

■ The national scrap picture is far from uniform this week. Nevertheless, it does lean in the direction of softness.

The final blow to dealers was the series of strikes. The Pittsburgh market was almost completely paralyzed by the strikes. The railroad problem cut into auto production around Cleveland.

However, in Philadelphia there appears to be no immediate worry among dealers. They say that preparation was made in advance of the strikes. In fact, some dealers note that it may be a blessing in disguise since mills will probably eat strongly into inventories.

That Weak Feeling—A growing feeling of weakness is reflected at both broker and dealer level in Chicago where mills are planning to study the market cautiously before buying. Prices are softer on some grades in Detroit.

Pittsburgh — Rail strikes almost completely paralyzed the market as mills can't take and dealers can't ship. A sale of No. 2 bundles for $26 is of academic interest but was quickly held up by the strike. Mills are not anxious enough for scrap to promote truck shipping, so they will sit it out. The strike should build up some demand and this is the dealer's main hope at present.

Chicago — Scrap prices are pegged by industrial bundles moving at last month's prices. A growing feeling of weakness is reflected at both broker and dealer levels. Mills have indicated they will look the market over before making new purchases. The withdrawal of some bids, as well as mild breaks in a price offered for small industrial lists, suggest that scrapmen are very wary about the immediate outlook.

Philadelphia — Shipments continue at a slow pace and there have not been enough actual purchases to cause any price changes. Most dealers aren't too concerned yet about the rail strike. Plans were made in advance and shipments are moving on schedule. Nevertheless, dealers do fear that a prolonged strike could mean difficulty.

New York — The market continues to ride along at a comfortable level based solely on export demand. But there is a growing feeling that some improvement for dealers will enter the picture in the near future. Most dealers vary on the September forecast. Estimates range from "a slight improvement" to "a heck of a month."

Detroit — The majority of September's industrial list tonnage is leaving Detroit. Busheling is going to Warren and Canton, O. The bulk of No. 1 bundles went to overseas exporters. There has been no recent Canadian action. Prices did soften on some grades, mostly openhearth.

Cleveland — The market has a weak undertone as dealers are unable to move any tonnage. Auto lists were off about $1 and will probably go out of the area. The railroad strike will also cut auto list production.

Cincinnati—The market took a bad turn for dealers as a large mill withdrew totally from the market for the first month in more than a year. And another mill is taking only minor tonnage at the same price. But there's no rush to fill this order.

St. Louis—Most scrap prices are unchanged this week. The present supply can be more than absorbed. Actual movement is very slow and dealers have apparently given up hope for any significant upturn this year. Stoveplate is up $2.

Birmingham — The scrap supply is again tight for most grades and foundries are showing more interest this week because of the shortages. An electric furnace released shipments on orders bought early in August and indicated it would buy early this month. Foundries are paying $37 for 2-ft electric furnace steel. This is $4 more than the going price of bundles and 3-ft lengths.

Buffalo — Prices are unchanged in an inactive market. There were no sales this week and dealers claim to be expecting no new activity in the near future.

Boston — The picture has not changed greatly from last week. Exports are up somewhat and the firm tone continues in this market. Prices are stable.

West Coast—Domestic market is at a virtual standstill. Dealers look for export business to keep dropping off. One major mill claims to have a 20-month scrap inventory.

Houston — The domestic market continues at a slow pace. However, export is providing an outlet for some scrap. The weather is still causing some dealers to worry because rain has bogged down scrap intake.

SCRAP PRICES

(Effective Sept. 6, 1960)

Iron and Steel Scrap

Going prices of iron and steel scrap as obtained in the trade by THE IRON AGE based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

Pittsburgh

No. 1 hvy. melting	$31.00 to $32.00
No. 2 hvy. melting	26.00 to 27.00
No. 1 dealer bundles	32.00 to 33.00
No. 1 factory bundles	38.00 to 39.00
No. 2 bundles	24.00 to 25.00
No. 1 busheling	31.00 to 32.00
Machine shop turn.	15.00 to 16.00
Shoveling turnings	20.00 to 21.00
Cast iron borings	19.00 to 20.00
Low phos. punch'gs plate	38.00 to 39.00
Heavy turnings	27.00 to 28.00
No. 1 RR hvy. melting	37.00 to 38.00
Scrap rails, random lgth.	46.00 to 47.00
Rails 2 ft and under	50.00 to 51.00
RR specialties	47.00 to 48.00
No. 1 machinery cast.	47.00 to 48.00
Cupola cast.	38.00 to 39.00
Heavy breakable cast.	36.00 to 37.00
Stainless	
18-8 bundles and solids	185.00 to 190.00
18-8 turnings	95.00 to 100.00
430 bundles and solids	90.00 to 95.00
410 turnings	60.00 to 65.00

Chicago

No. 1 hvy. melting	$31.00 to $32.00
No. 2 hvy. melting	29.00 to 30.00
No. 1 dealer bundles	32.00 to 33.00
No. 1 factory bundles	37.00 to 38.00
No. 2 bundles	20.00 to 21.00
No. 1 busheling	31.00 to 32.00
Machine shop turn.	15.00 to 16.00
Mixed bor. and turn.	17.00 to 18.00
Shoveling turnings	17.00 to 18.00
Cast iron borings	17.00 to 18.00
Low phos. forge crops	42.00 to 43.00
Low phos. punch'gs plate, ¼ in. and heavier	38.00 to 39.00
Low phos. 2 ft. and under	36.00 to 37.00
No. 1 RR hvy. melting	35.00 to 36.00
Scrap rails, random lgth.	42.00 to 43.00
Rerolling rails	53.00 to 54.00
Rails 2 ft. and under	48.00 to 49.00
Angles and splice bars	43.00 to 44.00
RR steel car axles	50.00 to 51.00
RR couplers and knuckles	40.00 to 41.00
No. 1 machinery cast.	46.00 to 48.00
Cupola cast.	41.00 to 42.00
Cast iron wheels	32.00 to 33.00
Malleable	45.00 to 46.00
Stove plate	34.00 to 36.00
Steel car wheels	39.00 to 40.00
Stainless	
18-8 bundles and solids	175.00 to 180.00
18-8 turnings	85.00 to 90.00
430 bundles and solids	85.00 to 90.00
430 turnings	40.00 to 50.00

Philadelphia Area

No. 1 hvy. melting	$34.00 to $35.00
No. 2 hvy. melting	30.00 to 31.00
No. 1 dealer bundles	35.00 to 36.00
No. 2 bundles	22.00 to 23.00
No. 1 busheling	35.00 to 36.00
Machine shop turn.	14.00 to 15.00
Mixed bor. short turn.	14.00 to 15.00
Cast iron borings	14.00 to 15.00
Shoveling turnings	20.00 to 21.00
Clean cast. chem. borings	23.00 to 24.00
Low phos. 5 ft and under	37.00 to 38.00
Low phos. 2 ft punch'gs	39.00 to 40.00
Elec. furnace bundles	36.00 to 37.00
Heavy turnings	27.00 to 28.00
RR specialties	39.00 to 40.00
Rails, 18 in. and under	51.00 to 52.00
Cupola cast.	38.00 to 39.00
Heavy breakable cast.	39.00 to 40.00
Cast iron car wheels	40.00 to 41.00
Malleable	45.00 to 46.00
No. 1 machinery cast.	49.00 to 50.00

Cincinnati

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$26.50 to $27.50
No. 2 hvy. melting	22.50 to 23.50
No. 1 dealer bundles	26.50 to 27.50
No. 2 bundles	17.50 to 18.50
Machine shop turn.	10.00 to 11.00
Shoveling turnings	13.00 to 14.00
Cast iron borings	13.00 to 14.00
Low phos. 18 in. and under	35.00 to 36.00
Rails, random length	42.00 to 43.00
Rails, 18 in. and under	50.00 to 51.00
No. 1 cupola cast.	37.00 to 38.00
Hvy. breakable cast.	31.00 to 32.00
Drop broken cast.	49.00 to 50.00

Youngstown

No. 1 hvy. melting	$33.00 to $34.00
No. 2 hvy. melting	26.00 to 27.00
No. 1 dealer bundles	33.00 to 34.00
No. 2 bundles	22.00 to 23.00
Machine shop turn.	16.00 to 17.00
Shoveling turnings	19.00 to 20.00
Low phos. plate	35.00 to 36.00

Cleveland

No. 1 hvy. melting	$31.00 to $32.00
No. 2 hvy. melting	22.50 to 23.50
No. 1 dealer bundles	31.00 to 32.00
No. 1 factory bundles	33.50 to 34.50
No. 2 bundles	19.00 to 20.00
No. 1 busheling	31.00 to 32.00
Machine shop turn.	13.00 to 14.00
Mixed bor. and turn.	16.00 to 17.00
Shoveling turnings	16.00 to 17.00
Cast iron borings	16.00 to 17.00
Cut structural & plates, 2 ft. & under	37.00 to 38.00
Low phos. punch'gs plate	32.00 to 33.00
Drop forge flashings	31.00 to 32.00
Foundry steel, 2 ft. & under	34.00 to 35.00
No. 1 RR hvy. melting	34.50 to 35.50
Rails 2 ft. and under	49.00 to 50.00
Rails 18 in. and under	50.00 to 51.00
Steel axle turnings	24.00 to 25.00
Railroad cast.	47.00 to 48.00
No. 1 machinery cast.	50.00 to 51.00
Stove plate	39.00 to 40.00
Malleable	45.00 to 46.00
Stainless	
18-8 bundles	180.00 to 185.00
18-8 turnings	75.00 to 80.00
430 bundles	80.00 to 85.00

Buffalo

No. 1 hvy. melting	$29.00 to $30.00
No. 2 hvy. melting	25.00 to 26.00
No. 1 busheling	29.00 to 30.00
No. 1 dealer bundles	29.00 to 30.00
No. 2 bundles	21.00 to 22.00
Machine shop turn.	12.00 to 13.00
Mixed bor. and turn.	13.00 to 14.00
Shoveling turnings	16.00 to 17.00
Cast iron borings	14.00 to 15.00
Low phos. plate	36.00 to 37.00
Structurals and plate, 2 ft. and under	38.00 to 39.00
Scrap rails, random lgth.	37.00 to 38.00
Rails 2 ft. and under	47.00 to 48.00
No. 1 machinery cast.	46.00 to 47.00
No. 1 cupola cast.	40.00 to 41.00

St. Louis

No. 1 hvy. melting	$30.00 to $31.00
No. 2 hvy. melting	28.00 to 29.00
Foundry steel, 2 ft.	31.00 to 32.00
No. 1 dealer bundles	33.00 to 34.00
No. 2 bundles	20.00 to 21.00
Machine shop turn.	8.00 to 9.00
Shoveling turnings	10.00 to 11.00
Cast iron borings	21.00 to 22.00
No. 1 RR hvy. melting	34.00 to 35.00
Rails, random lengths	40.00 to 41.00
Rails, 18 in. and under	42.00 to 43.00
RR specialties	39.00 to 40.00
Cupola cast.	42.00 to 43.00
Heavy breakable cast.	35.00 to 36.00
Stove plate	38.00 to 39.00
Cast iron car wheels	35.00 to 36.00
Rerolling rails	52.00 to 53.00
Unstripped motor blocks	36.00 to 37.00

Birmingham

No. 1 hvy. melting	$29.00 to $30.00
No. 2 hvy. melting	24.00 to 25.00
No. 1 dealer bundles	29.00 to 30.00
No. 2 bundles	19.00 to 20.00
No. 1 busheling	31.00 to 32.00
Machine shop turn.	17.00 to 18.00
Shoveling turnings	19.00 to 20.00
Cast iron borings	9.00 to 10.00
Electric furnace bundles	32.00 to 33.00
Elec. furnace, 3 ft. & under	32.00 to 33.00
Bar crops and plate	39.00 to 40.00
Structural and plate, 2 ft.	38.00 to 39.00
No. 1 RR hvy. melting	30.00 to 31.00
Scrap rail, random lgth.	39.00 to 40.00
Rails, 18 in. and under	45.00 to 46.00
Angles and splice bars	38.00 to 39.00
No. 1 cupola cast.	46.00 to 47.00
Stove plate	46.00 to 47.00
Cast iron car wheels	38.00 to 39.00
Unstripped motor blocks	34.00 to 35.00

New York

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$29.00 to $30.00
No. 2 hvy. melting	21.00 to 22.00
No. 2 dealer bundles	16.00 to 17.00
Machine shop turnings	7.00 to 8.00
Mixed bor. and turn.	9.00 to 10.00
Shoveling turnings	10.00 to 11.00
Clean cast. chem. borings	18.00 to 19.00
No. 1 machinery cast.	37.00 to 38.00
Mixed yard cast.	33.00 to 34.00
Heavy breakable cast.	31.00 to 32.00
Stainless	
18-8 prepared solids	165.00 to 170.00
18-8 turnings	80.00 to 85.00
430 prepared solids	70.00 to 75.00
430 turnings	20.00 to 25.00

Detroit

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$26.00 to $27.00
No. 2 hvy. melting	18.00 to 19.00
No. 1 dealer bundles	28.00 to 29.00
No. 2 bundles	17.00 to 18.00
No. 1 busheling	25.00 to 26.00
Drop forge flashings	25.00 to 26.00
Machine shop turn.	9.00 to 10.00
Mixed bor. and turn.	12.00 to 13.00
Shoveling turnings	12.00 to 13.00
Cast iron borings	12.00 to 13.00
Heavy breakable cast.	30.00 to 31.00
Mixed cupola cast.	35.00 to 36.00
Automotive cast.	42.00 to 43.00
Stainless	
18-8 bundles and solids	170.00 to 175.00
18-8 turnings	60.00 to 65.00
430 bundles and solids	60.00 to 65.00

Boston

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$25.00 to $26.00
No. 2 hvy. melting	20.00 to 21.00
No. 1 dealer bundles	25.00 to 26.00
No. 2 bundles	14.00 to 15.00
No. 1 busheling	25.00 to 26.00
Machine shop turn.	5.00 to 6.00
Shoveling turnings	8.00 to 9.00
Clean cast. chem. borings	12.00 to 13.00
No. 1 machinery cast.	38.00 to 39.00
Mixed cupola cast.	32.00 to 33.00
Heavy breakable cast.	27.50 to 28.50

San Francisco

No. 1 hvy. melting	....	$34.00
No. 2 hvy. melting	....	30.00
No. 1 dealer bundles	....	30.00
No. 2 bundles	....	20.00
Machine shop turn.	$14.00 to	15.00
Cast iron borings	14.00 to	15.00
No. 1 cupola cast.	....	46.00

Los Angeles

No. 1 hvy. melting	....	$32.00
No. 2 hvy. melting	....	29.00
No. 1 dealer bundles	....	27.00
No. 2 bundles	....	17.00
Machine shop turn.	....	13.00
Shoveling turnings	....	15.00
Cast iron borings	$15.00 to	16.00
Elec. furnace 1 ft. and under (foundry)	42.00 to	43.00
No. 1 cupola cast.	....	44.00

Seattle

No. 1 hvy. melting	....	$35.00
No. 2 hvy. melting	....	33.00
No. 2 bundles	....	22.00
No. 1 cupola cast.	....	36.00
Mixed yard cast.	....	36.00

Hamilton, Ont.

Brokers buying prices per net ton on cars:

No. 1 hvy. melting	....	$25.80
No. 2 hvy. melting cut 3 ft. and under	....	22.50
No. 1 dealer bundles	....	25.80
No. 2 bundles	....	19.00
Mixed steel scrap	....	16.00
Bush., new fact., prep'd	....	25.50
Bush., new fact., unprep'd	....	20.45
Machine shop turn.	....	12.00
Short steel turn.	....	12.00
Mixed bor. and turn.	....	12.00
Cast scrap	....	33.00

Houston

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	....	$34.00
No. 2 hvy. melting	....	31.00
No. 2 bundles	....	18.00
Machine shop turn.	....	12.00
Shoveling turnings	....	14.00
Cut structural plate 2 ft. & under	$40.00 to	41.00
Unstripped motor blocks	26.00 to	27.00
Cupola cast.	32.00 to	33.00
Heavy breakable cast.	25.00 to	26.00

Copper Softens Despite Congo

European copper consumers are loaded with inventories and are not rushing into the market.

At the same time, the U. S. market is no stronger. In fact, the 33c price may be challenged.

■ European copper consumers are being forced to abandon their usual policy of buying in anticipation of developments in world copper markets.

For example, many have been telling U. S. sellers they believe the situation in the Congo, source of 8 pct of Free World copper supply, and most of which goes to Europe, will get worse.

They say there's a better than even chance Congo copper mines will soon be forced to close down. And there's a better than outside chance whole output will be lost behind the Iron Curtain.

No Sale—But the plain fact is that inventories of the European consumers are bulging to the extent they can't afford to hedge another pound. This, combined with the leveling off somewhat of the booming European economy, is softening world copper markets even in the face of the Congo crisis.

For most of 1960, European buying has been a big support of the U. S. market. But the full effect of the cutbacks by European buyers hasn't reached the U. S. markets yet. Indications now are that the test for U. S. markets, and the current U. S. price picture, will come later this month.

Market Weakening—Custom smelters report sales are generally disappointing. But business has been consistently below their hopes and expectations through most of the third quarter.

Brass mills say the current level of their business is poor. But, as with the smelters, this has been the case through the summer. Brass mills are looking for a pickup this month. The head of a large mill says, "If we don't get a pickup, we'll be in some trouble."

Will 33¢ Hold?—Custom smelters have shown more patience this year than in recent years. But they are still closer to classical marketing than most segments of the copper industry. If the current 33¢ per lb price doesn't start bringing in more business, there is little doubt that it will come down.

U. S. producers, which supply the lion's share of the domestic supply, are more likely to hold the current price. In the face of growing softness in world copper markets, most copper executives think their companies will hold the 33¢ price through 1960.

Inventory Factor—One producer says the producer price isn't threatened until custom smelters lower their price and make it stick. If the lower price doesn't bring in business, producers will hold.

Most copper sellers believe that U. S. consumers have much lower inventories than European copper consumers.

"As long as the price is stable and buyers can get quick delivery, the consumer will keep his inventory at rock bottom, Congo or no Congo," says one copper seller.

Lead-Zinc

President Eisenhower vetoed the Lead-Zinc bill which would have authorized direct government aid to the depressed lead and zinc miners.

Asserting that "the problems of our lead and zinc miners have caused me concern for some time," the President said the subsidy bill would harm rather than help the industry.

The President said the bill had three "fatal qualities":

It would intensify the industry's problems by generating additional production.

The subsidies would complicate government programs now in effect.

The subsidies would generate demands for equal treatment.

Tin prices for the week: Aug. 31—102.25; Sept. 1—102.50; Sept. 2—102.75; Sept. 5—Holiday; Sept. 6—102.75.*

* Estimate

Monthly Average Metal Prices

(Cents per lb except as noted)

Average prices of the major nonferrous metals in AUGUST based on quotations appearing in THE IRON AGE, were as follows:

Electrolytic copper, del'd Conn. Valley	33.00
Copper, Lake	33.00
Straits, Tin, New York	102.853
Zinc, E. St. Louis	12.90
Lead, St. Louis	11.80
Aluminum ingot	28.10

Note: Quotations are on going prices

Primary Prices

(cents per lb)	current price	last price	date of change
Aluminum ingot	26.00	24.70	12/17/59
Copper (E)	33.00	30-33	11/12/59
Copper (CS)	33.00	35.00	3/11/60
Copper (L)	33.00	31.50	11/6/59
Lead, St. L.	11.80	12.30	12/21/59
Lead, N. Y.	12.00	12.50	12/21/59
Magnesium ingot	36.00	34.50	8/13/58
Magnesium pig	35.25	33.75	8/13/58
Nickel	74.00	64.50	12/8/58
Titanium sponge	150-180	182-182	8/1/59
Zinc, E. St. L.	13.00	12.50	1/8/60
Zinc, N. Y.	13.50	13.00	1/8/60

ALUMINUM: 99% Ingot COPPER: (E) = electrolytic, (CS) = custom smelters, electrolytic. (L) = lake. LEAD: common grade. MAGNESIUM: 99.8% pig Velasco Tex. NICKEL: Port Colborne, Canada. ZINC: prime western. TIN: See above; Other primary prices, pg. 145.

MILL PRODUCTS

(Cents per lb unless otherwise noted)

ALUMINUM

(Base 30,000 lb, f.o.b. customer's plant)

Flat Sheet (Mill Finish and Plate)

("F" temper except 6061-0)

Alloy	.030-.038	.048-.061	.077-.096	.136-.250
1100, 3003	48.4	47.4	46.4	45.4
5052	55.8	53.0	50.8	49.2
6061-0	53.0	50.3	48.4	47.0

Extruded Solid Shapes

Factor	6063 T-5	6062 T-6
1-17	45.3-46.8	54.0-61.8
18-32	45.8-47.5	58.6-81.5
33-38	49.5-52.2	85.1-96.6
39-44	59.8-63.6	102.0-124.0

Screw Machine Stock—2011-T-3

Size"	7/32-5/16	11/32-23/32	3/4-1 1/16	1 3/32-1 1/2
Price	60.0	59.2	57.7	55.3

Roofing Sheet, Corrugated

(Per sheet, 26" wide base, 16,000 lb)

Length"→	72	96	120	144
.019 gage	$1.506	$2.013	$2.515	$3.017

MAGNESIUM

(F.o.b. shipping pt., carload frt. allowed)

Sheet and Plate

Type↓ Gage→	.250 3.00	.250-2.00	.188	.081	.032
AZ31B Stand. Grade	.....	67.9	69.0	77.9	103.1
AZ31B Spec.	.....	93.3	96.9	108.7	171.3
Tread Plate	.....	70.6	71.7	.....	.....
Tooling Plate	73.0	.....	.....	.....	.....

Extruded Shapes

factor→	6-8	12-14	24-26	36-38
Comm. Grade. (AZ31C)	65.3	65.3	66.1	71.5
Spec. Grade... (AZ31B)	84.6	85.7	90.6	104.2

Alloy Ingot

AZ91B (Die Casting) ..... 37.25 (delivered)
AZ63A, AZ92A, AZ91C (Sand Casting) 40.75 (Velasco, Tex.)

NICKEL, MONEL, INCONEL

(Base prices f.o.b. mill)

	"A" Nickel	Monel	Inconel
Sheet, CR	138	120	138
Strip, CR	124	108	138
Rod, bar, HR	107	89	109
Angles, HR	107	89	109
Plates, HR	130	110	126
Seamless tube	157	129	200
Shot, blocks	...	87	...

COPPER, BRASS, BRONZE

(Freight included in 5000 lbs)

	Sheet	Wire	Rod	Tube
Copper	57.13	.....	54.86	58.32
Brass, Yellow	50.57	50.86	50.26	54.23
Brass, Low	53.53	53.82	53.22	57.09
Brass, R L	54.58	54.87	54.27	58.14
Brass, Naval	55.12	.....	48.68	58.78
Munts Metal	53.20	.....	48.26	.....
Comm. Bz.	56.17	56.46	55.86	59.48
Mang. Bz.	58.86	.....	52.21	.....
Phos. Bz. 5%	77.44	.....	78.10	.....

Free Cutting Brass Rod 36.06

TITANIUM

(Base prices f.o.b. mill)

Sheet and strip, commercially pure, $6.75-$13.00; alloy, $13.40-$17.00. Plate, HR, commercially pure, $5.25-$9.00; alloy, $8.00-$10.00. Wire, rolled and/or drawn, commercially pure, $5.55-$6.05; alloy, $5.55-$9.00; bar, HR or forged, commercially pure, $4.00-$4.50; alloy, $4.00-$6.25; billets, HR, commercially pure, $3.20-$3.70; alloy, $3.20-$4.75.

PRIMARY METAL

(Cents per lb unless otherwise noted)

Antimony, American, Laredo, Tex.. 29.50
Beryllium Aluminum 5% Be, Dollars per lb contained Be $65.00
Beryllium copper, per lb conta'd Be. $43.00
Beryllium 97% lump or beads, f.o.b. Cleveland, Reading $70.00
Bismuth, ton lots ..... $ 2.25
Cadmium, del'd ..... $ 1.50
Calcium, 99.9% small lots ..... $ 4.55
Chromium, 99.8% metallic base.... $ 1.31
Cobalt, 97-99% (per lb) ..... $1.50 to $1.57
Germanium, per gm, f.o.b. Miami, Okla., refined ..... 29.95 to 36.95
Gold, U. S. Treas., per troy oz..... $35.00
Indium, 99.9%, dollars per troy oz.. $2.25
Iridium, dollars per troy oz..... $75 to $85
Lithium, 98% ..... $9.00 to $12.00
Magnesium sticks, 10,000 lb. 57.00
Mercury, dollars per 76-lb flask f.o.b. New York ..... $208 to $210
Nickel oxide sinter at Buffalo, N. Y., or other U. S. points of entry, contained nickel 69.60
Palladium, dollars per troy oz.. $24 to $26
Platinum, dollars per troy oz.. $82 to $85
Rhodium ..... $137 to $140
Silver ingots (¢ per troy oz.) 91.375
Thorium, per kg. $43.00
Vanadium ..... $ 3.65
Zirconium sponge ..... $ 5.00

REMELTED METALS

Brass Ingot

(Cents per lb delivered, carloads)

85-5-5 ingot
- No. 115 ..... 29.25
- No. 120 ..... 28.25
- No. 123 ..... 27.25

80-10-10 ingot
- No. 305 ..... 33.75
- No. 315 ..... 31.50

88-10-2 ingot
- No. 210 ..... 42.00
- No. 215 ..... 38.75
- No. 245 ..... 34.00

Yellow ingot
- No. 405 ..... 23.75

Manganese bronze
- No. 421 ..... 28.25

Aluminum Ingot

(Cents per lb del'd 30,000 lb and over)

95-5 aluminum-silicon alloys
- 0.30 copper max. 25.25-25.50
- 0.60 copper max. 25.00-25.25

Piston alloys (No. 132 type)..27.00-28.00
No. 12 alum. (No. 2 grade)...23.75-24.25
108 alloy 24.25-24.75
195 alloy 26.75-27.75
13 alloy (0.60 copper max.)....24.75-25.00
AXS-679 (1 pct zinc) 24.00-25.00

(Effective Sept. 6, 1960)

Steel deoxidizing aluminum notch bar granulated or shot

Grade 1—95-97½% 24.75-25.75
Grade 2—92-95% 23.50-24.50
Grade 3—90-92% 22.50-23.50
Grade 4—85-90% 22.00-23.00

SCRAP METAL

Brass Mill Scrap

(Cents per pound, add 1¢ per lb for shipments of 20,000 lb and over)

	Heavy	Turnings
Copper	29	28¼
Yellow brass	22¼	20¼
Red brass	25¾	25
Comm. bronze	26½	26
Mang. bronze	20¾	20
Free cutting rod ends.	21¼	

Customs Smelters Scrap

(Cents per pound carload lots, delivered to refinery)

- No. 1 copper wire 27¾
- No. 2 copper wire 26
- Light copper 23¾
- *Refinery brass 24
- Copper bearing material 23

*Dry copper content.

Ingot Makers Scrap

(Cents per pound carload lots, delivered to refinery)

- No. 1 copper wire 27½
- No. 2 copper wire 26¾
- Light copper 23¼
- No. 1 composition 22
- No. 1 comp. turnings 21¼
- Hvy. yellow brass solids 16¾
- Brass pipe 15
- Radiators 17¾

Aluminum

- Mixed old cast. ..... 13½—14
- Mixed new clips ..... 14½—15½
- Mixed turnings, dry ..... 14 —14½

Dealers' Scrap

(Dealers' Buying price f.o.b. New York in cents per pound)

Copper and Brass

- No. 1 copper wire ..... 23½—24
- No. 2 copper wire ..... 21½—22
- Light copper ..... 19½—20
- Auto radiators (unsweated).. 13¼—13¾
- No. 1 composition ..... 18 —18½
- No. 1 composition turnings... 16½—17
- Cocks and faucets ..... 13¾—14¼
- Clean heavy yellow brass ... 12¾—13¼
- Brass pipe ..... 14¼—14¾
- New soft brass clippings .... 14½—15
- No. 1 brass rod turnings .... 13¼—13¾

Aluminum

- Alum. pistons and struts .... 7½— 8
- Aluminum crankcase ..... 9½—10
- 1100 (2s) aluminum clippings 12½—13
- Old sheet and utensils ..... 9½—10
- Borings and turnings ..... 5½— 6
- Industrial castings ..... 10 —10½
- 2020 (24s) clippings ..... 12½—13

Zinc

- New zinc clippings ..... 7 — 7¼
- Old zinc ..... 4½— 5
- Zinc routings ..... 3¼— 3½
- Old die cast scrap ..... 2¾— 3

Nickel and Monel

- Pure nickel clippings 52-54
- Clean nickel turnings 40
- Nickel anodes 52-54
- Nickel rod ends 52-54
- New Monel clippings 23-23.50
- Clean Monel turnings 16.50-17
- Old sheet Monel 22-23
- Nickel silver clippings, mixed 18
- Nickel silver turnings, mixed. 15

Lead

- Soft scrap lead ..... 8 — 8¼
- Battery plates (dry) ..... 3 — 3¼
- Batteries, acid free ..... 2 — 2¼

Miscellaneous

- Block tin ..... 79 —80
- No. 1 pewter ..... 59 —60
- Auto babbitt ..... 43 —44
- Mixed common babbitt ..... 10¼—10¾
- Solder joints ..... 14½—15
- Siphon tops 41
- Small foundry type ..... 9¾—10¼
- Monotype ..... 9¾—10¼
- Lino. and stereotype ..... 8¾— 9
- Electrotype ..... 7½— 7¾
- Hand picked type shells ..... 5¼— 5¾
- Lino. and stereo. dross ..... 2¼— 2¾
- Electro dross ..... 2¼— 2¾

IRON AGE

STEEL PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		BILLETS, BLOOMS, SLABS			PILING	SHAPES STRUCTURALS			STRIP					
		Carbon Rerolling Net Ton	Carbon Forging Net Ton	Alloy Net Ton	Sheet Steel	Carbon	Hi Str. Low Alloy	Carbon Wide-Flange	Hot-rolled	Cold-rolled	Hi Str. H.R. Low Alloy	Hi Str. C.R. Low Alloy	Alloy Hot-rolled	Alloy Cold-rolled
EAST	Bethlehem, Pa.			$119.00 *B3*		5.55 *B3*	8.10 *B3*	5.55 *B5*						
	Buffalo, N. Y.	$80.00 *R3, B3*	$99.50 *R3, B3*	$119.00 *R3, B3*	6.50 *B3*	5.55 *B3*	8.10 *B3*	5.55 *B3*	5.10 *B3,*	7.425 *S10, R7*	7.575 *B3*			
	Phila., Pa.									7.875 *P15*				
	Harrison, N. J.													15.55 *C11*
	Conshohocken, Pa.		$104.50 *A2*	$126.00 *A2*					5.15 *A2*		7.575 *A2*			
	New Bedford, Mass.									7.875 *R6*				
	Johnstown, Pa.	$80.00 *B3*	$99.50 *B3*	$119.00 *B3*		5.55 *B3*	8.10 *B3*							
	Boston, Mass.									7.975 *T8*				15.90 *T8*
	New Castle, Pa.									7.425* *M10*				
	New Haven, Conn.									7.875 *D1*				
	Baltimore, Md.									7.425 *T8*				15.90 *T8*
	Phoenixville, Pa.					5.55 *P2*		5.55 *P2*						
	Sparrows Pt., Md.								5.10 *B3*		7.575 *B3*			
	New Britain, Wallingford, Conn.			$119.00 *N8*						7.875 *W1,S7*				
	Pawtucket, R. I. Worcester, Mass.									7.975 *N7, A5*				15.90 *N7* 15.70 *T8*
MIDDLE WEST	Alton, Ill.								5.30 *L1*					
	Ashland, Ky.								5.10 *A7*		7.575 *A7*			
	Canton-Massillon, Dover, Ohio		$102.00 *R3*	$119.00 *R3, T5*						7.425 *G4*		10.80 *G4*		
	Chicago, Franklin Park, Evanston, Ill.	$80.00 *U1, R3*	$99.50 *U1, R3,W8*	$119.00 *U1, R3,W8*	6.50 *U1*	5.50 *U1, W8,P13*	8.05 *U1, Y1,W8*	5.50 *U1*	5.10 *W8, N4,A1*	7.525 *A1,T8, M8* 7.525* *M8*	7.575 *W8*		8.40 *W8, S9,13*	15.55 *A1, S9,G4,T8*
	Cleveland, Ohio									7.425 *A5,J3*		10.75 *A5*	8.40 *J3*	15.60 *N7*
	Detroit, Mich.			$119.00 *R5*					5.10 *G3, M2*	7.425 *M2, S1, D1,P11*	7.575 *G3*	10.80 *S1*		
	Anderson, Ind.									7.425 *G4*				
	Gary, Ind. Harbor, Indiana	$80.00 *U1*	$99.50 *U1*	$119.00 *U1, Y1*		5.50 *U1, I3*	8.05 *U1, J3*	5.50 *I3*	5.10 *U1, I3,Y1*	7.425 *Y1*	7.575 *U1, I3,Y1*	10.90 *Y1*	8.40 *U1, Y1*	
	Sterling, Ill.	$80.00 *N4*				5.50 *N4*	7.75 *N4*	5.50 *N4*	5.20 *N4*					
	Indianapolis, Ind.									7.575 *R5*				15.70 *R5*
	Newport, Ky.								5.10 *A9*				8.40 *A9*	
	Niles, Warren, Ohio Sharon, Pa.		$99.50 *S1; C10*	$119.00 *C10,S1*					5.10 *R3, S1*	7.425 *R3, T4,S1*	7.575 *R3, S1*	10.80 *R3, S1*	8.40 *S1*	15.55 *S1*
	Owensboro, Ky.	$80.00 *G5*	$99.50 *G5*	$119.00 *G5*										
	Pittsburgh, Midland, Butler, Aliquippa, McKeesport, Pa.	$80.00 *U1, P6*	$99.50 *U1, C11,P6*	$119.00 *U1, C11,B7*	6.50 *U1*	5.50 *U1, J3*	8.05 *U1, J3*	5.50 *U1*	5.10 *P6*	7.425 *J3,B4* 7.525 *E3*			8.40 *S9*	15.55 *S9* 15.60 *N7*
	Weirton, Wheeling, Follansbee, W. Va.				6.50 *U1, W3*	5.50 *W3*		5.50 *W3*	5.10 *W3*	7.425 *W5*	7.575 *W3*	10.80 *W3*		
	Youngstown, Ohio	$80.00 *R3*	$99.50 *Y1, C10*	$119.00 *Y1*			8.05 *Y1*		5.10 *U*	7.425 *Y1,R5*	7.575 *U1, Y1*	10.95 *Y1*	8.40 *U1, Y1*	15.55 *R5, Y1*
WEST	Fontana, Cal.	$90.50 *K1*	$109.00 *K1*	$140.00 *K1*		6.30 *K1*	8.85 *K1*	6.45 *K1*	5.825 *K1*	9.20 *K1*				
	Geneva, Utah		$99.50 *C7*			5.50 *C7*	8.05 *C7*							
	Kansas City, Mo.					5.60 *S2*	8.15 *S2*						8.65 *S2*	
	Los Angeles, Torrance, Cal.		$109.00 *B2*	$139.00 *B2*		6.20 *C7, B2*	8.75 *B2*		5.85 *C7, B2*	9.30 *C1,R5*			9.60 *B2*	17.75 *J3*
	Minnequa, Colo.					5.80 *C6*			6.20 *C6*	9.375 *C6*				
	Portland, Ore.					6.25 *O2*								
	San Francisco, Niles, Pittsburg, Cal.		$109.00 *B2*			6.15 *B2*	8.70 *B2*		5.85 *C7, B2*					
	Seattle, Wash.		$109.00 *B2*			6.25 *B2*	8.80 *B2*		6.10 *B2*					
SOUTH	Atlanta, Ga.					5.70 *A8*			5.10 *A8*					
	Fairfield, Ala. City, Birmingham, Ala.	$80.00 *T2*	$99.50 *T2*			5.50 *T2 R3,C16*	8.05 *T2*		5.10 *T2, R3,C16*		7.575 *T2*			
	Houston, Lone Star, Texas		$104.50 *S2*	$124.00 *S2*		5.60 *S2*	8.15 *S2*						8.65 *S2*	

* Electro-galvanized-plus galvanizing extras.

(Effective Sept. 2, 1960)

IRON AGE

STEEL PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		SHEETS								WIRE ROD	TINPLATE†		
		Hot-rolled 18 ga. & hvyr.	Cold-rolled	Galvanized (Hot-dipped)	Enameling	Long Terne	Hi Str. Low Alloy H.R.	Hi Str. Low Alloy C.R.	Hi Str. Low Alloy Galv.		Coke* 1.25-lb. base box	Electro** 0.25-lb. base box	Hollowware Enameling 29 ga.
EAST	Buffalo, N. Y.	5.10 *B3*	6.275 *B3*				7.525 *B3*	9.275 *B3*		6.40 *W6*	† Special coated mfg. terne deduct 35¢ from 1.25-lb. coke base box price, 0.75 lb./0.25 lb. add 55¢. Coe-making quality BLACKPLATE 55 to 128 lb. deduct $2.20 from 1.25 lb. coke base box. * COKES: 1.50-lb. add 25¢. **ELECTRO: 0.50-lb. add 25¢; 0.75-lb. add 65¢; 1.00-lb. add $1.00. Differential 1.00 lb./0.25 lb. add 65¢.		
	Claymont, Del.												
	Coatesville, Pa.												
	Conshohocken, Pa.	5.15 *A2*	6.325 *A2*				7.575 *A2*						
	Harrisburg, Pa.												
	Hartford, Conn.												
	Johnstown, Pa.									6.40 *B3*			
	Fairless, Pa.	5.15 *U1*	6.325 *U1*				7.575 *U1*	9.325 *U1*			$10.50 *U1*	$9.20 *U1*	
	New Haven, Conn.												
	Phoenixville, Pa.												
	Sparrows Pt., Md.	5.10 *B3*	6.275 *B3*	6.875 *B3*	6.775 *B3*		7.525 *B3*	9.275 *B3*	10.825 *B3*	6.50 *B3*	$10.40 *B3*	$9.10 *B3*	
	Worcester, Mass.									6.70 *A5*			
	Trenton, N. J.												
MIDDLE WEST	Alton, Ill.									6.60 *L1*			
	Ashland, Ky.	5.10 *A7*		6.875 *A7*	6.775 *A7*		7.525 *A7*						
	Canton-Massillon, Dover, Ohio			6.875 *R1, R3*									
	Chicago, Joliet, Ill.	5.10 *W8, A1*					7.525 *U1, W8*			6.40 *A5, R3, W8*			
	Sterling, Ill.									6.50 *N4, K2*			
	Cleveland, Ohio	5.10 *R3, J3*	6.275 *R3, J3*	7.65 *R3°*	6.775 *R3*		7.525 *R3, J3*	9.275 *R3, J3*		6.40 *A5*			
	Detroit, Mich.	5.10 *G3, M2*	6.275 *G3, M2*				7.525 *G3*	9.275 *G3*					
	Newport, Ky.	5.10 *A9*	6.275 *A9*										
	Gary, Ind. Harbor, Indiana	5.10 *U1, I3, Y1*	6.275 *U1, I3, Y1*	6.875 *U1, I3*	6.775 *U1, I3, Y1*	7.225 *U1*	7.525 *U1, Y1, I3*	9.275 *U1, Y1*		6.40 *Y1*	$10.40 *U1, Y1*	$9.10 *I3, U1, Y1*	7.85 *U1, Y1*
	Granite City, Ill.	5.20 *G2*	6.375 *G2*	6.975 *G2*								$9.20 *G2*	7.95 *G2*
	Kokomo, Ind.			6.975 *C9*						6.50 *C9*			
	Mansfield, Ohio	5.10 *E2*	6.275 *E2*			7.225 *E2*							
	Middletown, Ohio		6.275 *A7*	6.875 *A7*	6.775 *A7*	7.225 *A7*							
	Niles, Warren, Ohio Sharon, Pa.	5.10 *R3, S1*	6.275 *R3*	6.875 *R3* 7.65 *R3°*	6.775 *S1*	7.225 *S1°, R3*	7.525 *R3, S1*	9.275 *R3,*				$9.10 *R3*	
	Pittsburgh, Midland, Butler, Donora, Aliquippa, McKeesport, Pa.	5.10 *U1, J3, P6*	6.275 *U1, J3, P6*	6.875 *U1, J3* 7.50 *E3°*	6.775 *U1*		7.525 *U1, J3*	9.275 *U1, J3*	10.825 *U1, J3*	6.40 *A5, J3, P6*	$10.40 *U1, J3*	$9.10 *U1, J3*	7.85 *U1, J3*
	Portsmouth, Ohio	5.10 *P7*	6.275 *P7*							6.40 *P7*			
	Weirton, Wheeling, Follansbee, W. Va.	5.10 *W3, W5*	6.275 *W3, F3, W5*	6.875 *W3, W5* 7.50 *W3°*		7.225 *W3, W5*	7.525 *W3*	9.275 *W3*			$10.40 *W5, W3*	$9.10 *W5, W3*	7.85 *W3*
	Youngstown, Ohio	5.10 *U1, Y1*	6.275 *Y1*	7.50 *J3°*	6.775 *Y1*		7.525 *Y1*	9.275 *Y1*		6.40 *Y1*			
WEST	Fontana, Cal.	5.825 *K1*	7.40 *K1*				8.25 *K1*	10.40 *K1*			$11.05 *K1*	$9.75 *K1*	
	Geneva, Utah	5.20 *C7*											
	Kansas City, Mo.									6.65 *S2*			
	Los Angeles, Torrance, Cal.									7.20 *B2*			
	Minnequa, Colo.									6.65 *C6*			
	San Francisco, Niles, Pittsburg, Cal.	5.80 *C7*	7.225 *C7*	7.625 *C7*						7.20 *C7*	$11.05 *C7*	$9.75 *C7*	
SOUTH	Atlanta, Ga.												
	Fairfield, Ala. Alabama City, Ala.	5.10 *T2, R3*	6.275 *T2, R3*	6.875 *T2, R3*	6.775 *T2*					6.40 *T2, R3*	$10.50 *T2*	$9.20 *T2*	
	Houston, Texas									6.65 *S2*			

? Electrogalvanized sheets.

(Effective Sept. 2, 1960)

°7.425 at Sharon-Niles is 7.225

IRON AGE

STEEL PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		BARS						PLATES				WIRE
		Carbon† Steel	Reinforcing	Cold Finished	Alloy Hot-rolled	Alloy Cold Drawn	Hi Str. H.R. Low Alloy	Carbon Steel	Floor Plate	Alloy	Hi Str. Low Alloy	Mfr'a. Bright
EAST	Bethlehem, Pa.				6.725 *B3*	9.025 *B3*	8.30 *B3*					
	Buffalo, N. Y.	5.675 *R3,B3*	5.675 *R3,B3*	7.70 *B5*	6.725 *B3,R3*	9.025 *B3,B5*	8.30 *B3*	5.30 *B3*				8.00 *W6*
	Claymont, Del.							5.30 *C4*		7.50 *C4*	7.95 *C4*	
	Coatesville, Pa.							5.30 *L4*		7.50 *L4*	7.95 *L4*	
	Conshohocken, Pa.							5.30 *A2*	6.375 *A2*	7.50 *A2*	7.95 *A2*	
	Harrisburg, Pa.							5.30 *P2*	6.375 *P2*			
	Milton, Pa.	5.825 *M7*	5.825 *M7*									
	Hartford, Conn.			8.15 *R3*		9.325 *R3*						
	Johnstown, Pa.	5.675 *B3*	5.675 *B3*		6.725 *B3*		8.30 *B3*	5.30 *B3*		7.50 *B3*	7.95 *B3*	8.00 *B3*
	Fairless, Pa.	5.825 *U1*	5.825 *U1*		6.875 *U1*							
	Newark, Camden, N. J.			8.10 *W10, P10*		9.20 *W10, P10*						
	Bridgeport, Putnam, Willimantic, Conn.			8.20 *W10* 8.15 *J3*	6.80 *N8*	9.175 *N8*						
	Sparrows Pt., Md.		5.675 *B3*					5.30 *B3*		7.50 *B3*	7.95 *B3*	8.10 *B3*
	Palmer, Worcester, Readville, Mansfield, Mass.			8.20 *B5, C14*		9.325 *A5,B5*						8.30 *A5, W6*
	Spring City, Pa.			8.10 *K4*		9.20 *K4*						
MIDDLE WEST	Alton, Ill.	5.875 *L1*										8.20 *L1*
	Ashland, Newport, Ky.							5.30 *A7, A9*		7.50 *A9*	7.95 *A7*	
	Canton, Massillon, Mansfield, Ohio	6.15* *R3*		7.65 *R3,R2*	6.725 *R3, T5*	9.025 *R3,R2, T5*		5.30 *E2*				
	Chicago, Joliet, Waukegan, Madison, Harvey, Ill.	5.675 *U1,R3, W8,N4,P13*	5.675 *U1,R3, N4,P13,W8* 5.875 *L1*	7.65 *A5, W10,W8, B5,L2,N9*	6.725 *U1,R3, W8*	9.025 *A5, W10,W8, L2,N8,B5*	8.30 *U1,W8, R3*	5.30 *U1,A1, W8,I3*	6.375 *U1*	7.50 *U1, W8*	7.95 *U1, W8*	8.00 *A5,R3, W8,N4, K2,W7*
	Cleveland, Elyria, Ohio	5.675 *R3*	5.675 *R3*	7.65 *A5,C13, C18*		9.025 *A5, C13,C18*	8.30 *R3*	5.30 *R3,J3*	6.375 *J3*		7.95 *R3,J3*	8.00 *A5, C13,C18*
	Detroit, Plymouth, Mich.	5.675 *G3*	5.675 *G3*	7.90 *P3* 7.85 *P8,B5* 7.65 *R5*	6.725 *R5,G3*	9.025 *R5,P8* 9.225 *B5,P3*	8.30 *G3*	5.30 *G3*		7.50 *G3*	7.95 *G3*	
	Duluth, Minn.											8.00 *A5*
	Gary, Ind. Harbor, Crawfordsville, Hammond, Ind.	5.675 *U1,I3, Y1*	5.675 *U1,I3, Y1*	7.65 *R3,J3*	6.725 *U1,I3, Y1*	9.025 *R3,M4*	8.30 *U1,Y1*	5.30 *U1,I3, Y1*	6.375 *J3, I1*	7.50 *U1, Y1*	7.95 *U1, Y1,I3*	8.10 *M4*
	Granite City, Ill.							5.40 *G2*				
	Kokomo, Ind.		5.775 *C9*									8.10 *C9*
	Sterling, Ill.	5.775 *N4*	5.775 *N4*				7.925 *N4*	5.30 *N4*			7.625 *N4*	8.10 *K2*
	Niles, Warren, Ohio Sharon, Pa.			7.65 *C10*	6.725 *C10,*	9.025 *C10*		5.30 *R3,S1*		7.50 *S1*	7.95 *R3, S1*	
	Owensboro, Ky.	5.675 *G5*			6.725 *G5*							
	Pittsburgh, Midland, Donora, Aliquippa, Pa.	5.675 *U1,J3*	5.675 *U1,J3*	7.65 *A5,B4, R3,J3,C11, W10,S9,C8, M9*	6.725 *U1,J3, C11,B7*	9.025 *A5, W10,R3,S9, C11,C8,M9*	8.30 *U1,J3*	5.30 *U1,J3*	6.375 *U1,J3*	7.50 *U1, J3,B7*	7.95 *U1, J3,B7*	8.00 *A5, J3,P6*
	Portsmouth, Ohio											8.00 *P7*
	Weirton, Wheeling, Follansbee, W. Va.							5.30 *W5*				
	Youngstown, Ohio	5.675 *U1,R3, Y1*	5.675 *U1,R3, Y1*	7.65 *A1,Y1, F2*	6.725 *U1,Y1*	9.025 *Y1,F2*	8.30 *U1,Y1*	5.30 *U1, R3,Y1*		7.50 *Y1*	7.95 *U1,Y1*	8.00 *Y1*
WEST	Emeryville, Fontana, Cal.	6.425 *J5* 6.375 *K1*	6.425 *J5* 6.375 *K1*		7.775 *K1*		9.00 *K1*	6.10 *K1*		8.30 *K1*	8.75 *K1*	
	Geneva, Utah							5.30 *C7*			7.95 *C7*	
	Kansas City, Mo.	5.925 *S2*	5.925 *S2*		6.975 *S2*		8.55 *S2*					8.25 *S2*
	Los Angeles, Torrance, Cal.	6.375 *C7,B2*	6.375 *C7,B2*	9.10 *R3,P14, B5*	7.775 *B2*	11.00 *P14, B5*	9.00 *B2*					8.95 *B2*
	Minnequa, Colo.	6.125 *C6*	6.125 *C6*					6.15 *C6*				8.25 *C6*
	Portland, Ore.	6.425 *O2*	6.425 *O2*									
	San Francisco, Niles, Pittsburg, Cal.	6.375 *C7* 6.425 *B2*	6.375 *C7* 6.425 *B2*				9.05 *B2*					8.95 *C7,C6*
	Seattle, Wash.	6.425 *B2,N6, A10*	6.425 *B2,A10*				9.05 *B2*	6.20 *B2*		8.40 *B2*	8.85 *B2*	
SOUTH	Atlanta, Ga.	5.875 *A8*	5.25 *A8*									8.00 *A8*
	Fairfield City, Ala. Birmingham, Ala.	5.675 *T2,R3, C16*	5.675 *T2,R3, C16*	8.25 *C16*			8.30 *T2*	5.30 *T2,R3*			7.95 *T2*	8.00 *T2,R3*
	Houston, Ft. Worth, Lone Star, Texas	5.925 *S2*	5.925 *S2*		6.975 *S2*		8.55 *S2*	5.40 *S2*		7.60 *S2*	8.05 *S2*	8.25 *S2*

† Merchant Quality—Special Quality 35¢ higher. (Effective Sept. 2, 1960). * Special Quality.

STEEL PRICES

Key to Steel Producers

With Principal Offices

A1 Acme Steel Co., Chicago
A2 Alan Wood Steel Co., Conshohocken, Pa.
A3 Allegheny Ludlum Steel Corp., Pittsburgh
A4 American Cladmetals Co., Carnegie, Pa.
A5 American Steel & Wire Div., Cleveland
A6 Angel Nail & Chaplet Co., Cleveland
A7 Armco Steel Corp., Middletown, Ohio
A8 Atlantic Steel Co., Atlanta, Ga.
A9 Acme-Newport Steel Co., Newport, Ky.
A10 Alaska Steel Mills, Inc., Seattle, Wash.

B1 Babcock & Wilcox Tube Div., Beaver Falls, Pa.
B2 Bethlehem Steel Co., Pacific Coast Div.
B3 Bethlehem Steel Co., Bethlehem, Pa.
B4 Blair Strip Steel Co., New Castle, Pa.
B5 Bliss & Laughlin, Inc., Harvey, Ill.
B6 Brooke Plant, Wickwire-Spencer Steel Div., Birdsboro, Pa.
B7 A. M. Byers, Pittsburgh
B8 Braeburn Alloy Steel Corp., Braeburn, Pa.

C1 Calstrip Steel Corp., Los Angeles
C2 Carpenter Steel Co., Reading, Pa.
C4 Claymont Products Dept., Claymont, Del.
C6 Colorado Fuel & Iron Corp., Denver
C7 Columbia Geneva Steel Div., San Francisco
C8 Columbia Steel & Shafting Co., Pittsburgh
C9 Continental Steel Corp., Kokomo, Ind.
C10 Copperweld Steel Co., Pittsburgh, Pa.
C11 Crucible Steel Co. of America, Pittsburgh
C13 Cuyahoga Steel & Wire Co., Cleveland
C14 Compressed Steel Shafting Co., Readville, Mass.
C15 G. O. Carlson, Inc., Thorndale, Pa.
C16 Connors Steel Div., Birmingham
C18 Cold Drawn Steel Plant, Western Automatic Machine Screw Co., Elyria, O.

D1 Detroit Steel Corp., Detroit
D2 Driver, Wilbur B., Co., Newark, N. J.
D3 Driver Harris Co., Harrison, N. J.
D4 Dickson Weatherproof Nail Co., Evanston, Ill.

E1 Eastern Stainless Steel Corp., Baltimore
E2 Empire-Reeves Steel Corp., Mansfield, O.
E3 Enamel Products & Plating Co., McKeesport, Pa.

F1 Firth Sterling, Inc., McKeesport, Pa.
F2 Fitzsimons Steel Corp., Youngstown
F3 Follansbee Steel Corp., Follansbee, W. Va.

G2 Granite City Steel Co., Granite City, Ill.
G3 Great Lakes Steel Corp., Detroit
G4 Greer Steel Co., Dover, O.
G5 Green River Steel Corp., Owenboro, Ky.

H1 Hanna Furnace Corp., Detroit

I2 Ingersoll Steel Div., New Castle, Ind.
I3 Inland Steel Co., Chicago, Ill.
I4 Interlake Iron Corp., Cleveland

J1 Jackson Iron & Steel Co., Jackson, O.
J2 Jessop Steel Corp., Washington, Pa.
J3 Jones & Laughlin Steel Corp., Pittsburgh
J4 Joslyn Mfg. & Supply Co., Chicago
J5 Judson Steel Corp., Emeryville, Calif.

K1 Kaiser Steel Corp., Fontana, Calif.
K2 Keystone Steel & Wire Co., Peoria
K4 Keystone Drawn Steel Co., Spring City, Pa.

L1 Laclede Steel Co., St. Louis
L2 La Salle Steel Co., Chicago
L3 Lone Star Steel Co., Dallas
L4 Lukens Steel Co., Coatesville, Pa.

M1 Mahoning Valley Steel Co., Niles, O.
M2 McLouth Steel Corp., Detroit
M3 Mercer Tube & Mfg. Co., Sharon, Pa.
M4 Mid States Steel & Wire Co., Crawfordsville, Ind.
M7 Milton Steel Products Div., Milton, Pa.
M8 Mill Strip Products Co., Evanston, Ill.
M9 Moltrup Steel Products Co., Beaver Falls, Pa.
M10 Mill Strip Products Co., of Pa., New Castle, Pa.

N1 National Supply Co., Pittsburgh
N2 National Tube Div., Pittsburgh
N4 Northwestern Steel & Wire Co., Sterling, Ill.
N6 Northwest Steel Rolling Mills, Seattle
N7 Newman Crosby Steel Co., Pawtucket, R. I.
N8 Carpenter Steel of New England, Inc., Bridgeport, Conn.
N9 Nelson Steel & Wire Co.

O1 Oliver Iron & Steel Co., Pittsburgh
O2 Oregon Steel Mills, Portland

P1 Page Steel & Wire Div., Monessen, Pa.
P2 Phoenix Steel Corp., Phoenixville, Pa.
P3 Pilgrim Drawn Steel Div., Plymouth, Mich.
P4 Pittsburgh Coke & Chemical Co., Pittsburgh
P6 Pittsburgh Steel Co., Pittsburgh
P7 Portsmouth Div., Detroit Steel Corp., Detroit
P8 Plymouth Steel Co., Detroit
P9 Pacific States Steel Co., Niles, Cal.
P10 Precision Drawn Steel Co., Camden, N. J.
P11 Production Steel Strip Corp., Detroit
P13 Phoenix Mfg. Co., Joliet, Ill.
P14 Pacific Tube Co.
P15 Philadelphia Steel and Wire Corp.

R1 Reeves Steel & Mfg. Div., Dover, O.
R2 Reliance Div., Eaton Mfg. Co., Massillon, O.
R3 Republic Steel Corp., Cleveland
R4 Roebling Sons Co., John A., Trenton, N. J.
R5 Jones & Laughlin Steel Corp., Stainless and Strip Div.
R6 Rodney Metals, Inc., New Bedford, Mass.
R7 Rome Strip Steel Co., Rome, N. Y.

S1 Sharon Steel Corp., Sharon Pa.
S2 Sheffield Steel Div., Kansas City
S3 Shenango Furnace Co., Pittsburgh
S4 Simonds Saw and Steel Co., Fitchburg, Mass.
S5 Sweet's Steel Co., Williamsport, Pa.
S7 Stanley Works, New Britain, Conn.
S8 Superior Drawn Steel Co., Monaca, Pa.
S9 Superior Steel Div. of Copperweld Steel Co.
S10 Seneca Steel Service, Buffalo
S11 Southern Electric Steel Co., Birmingham
S12 Sierra Drawn Steel Corp., Los Angeles, Calif.
S13 Seymour Mfg. Co., Seymour, Conn.
S14 Screw and Bolt Corp. of America, Pittsburgh, Pa.

T1 Tonawanda Iron Div., N. Tonawanda, N. Y.
T2 Tennessee Coal & Iron Div., Fairfield
T3 Tennessee Products & Chem. Corp., Nashville
T4 Thomas Strip Div., Warren, O.
T5 Timken Steel & Tube Div., Canton, O.
T7 Texas Steel Co., Fort Worth
T8 Thompson Wire Co., Boston

U1 United States Steel Corp., Pittsburgh
U2 Universal-Cyclops Steel Corp., Bridgeville, Pa.
U3 Ulbrich Stainless Steels, Wallingford, Conn.
U4 U. S. Pipe & Foundry Co., Birmingham

W1 Wallingford Steel Co., Wallingford, Conn.
W2 Washington Steel Corp., Washington, Pa.
W3 Weirton Steel Co., Weirton, W. Va.
W4 Wheatland Tube Co., Wheatland, Pa.
W5 Wheeling Steel Corp., Wheeling, W. Va.
W6 Wickwire Spencer Steel Div., Buffalo
W7 Wilson Steel & Wire Co., Chicago.
W8 Wisconsin Steel Div., S. Chicago, Ill.
W9 Woodward Iron Co., Woodward, Ala.
W10 Wyckoff Steel Co., Pittsburgh
W12 Wallace Barnes Steel Div., Bristol, Conn.

Y1 Youngstown Sheet & Tube Co., Youngstown, O.

STEEL SERVICE CENTER PRICES

Metropolitan Price, dollars per 100 lb.

Cities	City Delivery‡ Charge	Sheets: Hot-Rolled (10 ga. & hvr.)	Sheets: Cold-Rolled (15 gage)	Sheets: Galvanized (10 gage)††	Strip: Hot-Rolled	Plates	Shapes: Standard Structural	Bars: Hot-Rolled (merchant)	Bars: Cold-Finished	Alloy Bars: Hot-Rolled 4615 As rolled	Alloy Bars: Hot-Rolled 4140 Annealed	Alloy Bars: Cold-Drawn 4615 As rolled	Alloy Bars: Cold-Drawn 4140 Annealed
Atlanta		9.37	10.61	11.83	10.85	9.73	9.94	9.53	13.24	.....	.....	.....	.....
Baltimore**	$.10	8.37	9.71	10.16	10.78	8.94	9.63	9.15	11.90	17.48	16.48	21.58	20.83
Birmingham**		8.46	10.20	10.69	9.45	8.41	8.47	8.26	13.14	16.76	.....	.....	.....
Boston**	.10	9.77	10.68	11.87	12.26	9.72	10.26	9.87	13.45	17.69	16.69	21.79	21.04
Buffalo**	.15	8.80	9.95	11.40	11.15	8.80	9.30	8.90	11.60	17.45	16.45	21.55	20.80
Chicago**	.15	8.72	10.35	10.30	10.89	8.56	9.06	8.70	10.80	17.10	16.10	21.20	20.45
Cincinnati**	.15	8.89	10.41	10.35	11.21	8.94	9.62	9.02	11.68	17.42	16.42	21.52	20.77
Cleveland**	.15	8.72[1]	10.13	11.39	11.01	8.80	9.45	8.81	11.40	17.21	16.21	21.31	20.56
Denver	.20	9.60	11.84	12.94	9.63	9.96	10.04	10.00	11.19	.....	.....	.....	20.84
Detroit**	.15	8.98	10.61	10.65	11.26	8.93	9.62	9.01	11.16	17.38	16.38	21.48	20.73
Houston**		9.22	10.03	12.19[3]	10.78	8.95	8.86	8.63	13.10	17.50	16.55	21.55	20.85
Kansas City**	.15	9.36	11.02	11.50	11.02	9.25	9.95	9.46	11.72	17.17	15.87	21.87	21.12
Los Angeles**		9.59[1]	11.29	12.20	11.29	9.82	10.54	9.67	14.20	18.30	17.35	22.90	22.20
Memphis**	.15	9.99	10.20	.....	11.39	10.27	10.48	10.07	12.89	.....	.....	.....	.....
Milwaukee**	.15	8.86	10.49	10.44	11.03	8.70	9.28	8.84	11.04	17.24	16.24	21.24	20.49
New York	.10	9.46	10.23	11.45	11.56	9.61	10.30	9.84	13.35	17.50	16.50	21.60	20.85
Norfolk	.20	8.20	.....	.....	8.90	8.65	9.20	8.90	10.70	.....	.....	.....	.....
Philadelphia**	.10	8.95	10.10	10.76	10.95	9.30	9.95	9.35	12.05	17.48	16.48	21.58	20.83
Pittsburgh**	.15	8.72	10.13	11.28	10.99	8.56	9.06	8.70	11.40	17.10	16.10	19.70	20.45
Portland**		10.20	12.05	12.35	12.20	10.35	10.80	10.20	16.65	18.50	17.45	20.75	20.25
San Francisco**	.10	10.27	11.79[2]	11.55	11.88	10.48	10.50	10.17	15.20	18.30	17.35	22.90	22.20
Seattle**		10.51	11.57	12.50	11.95	10.10	10.65	9.94	16.20	18.60	17.80	22.70	22.20
Spokane**	.15	10.51	11.57	12.50	11.95	10.10	10.65	9.94	16.35	17.75	17.95	21.58	22.35
St. Louis**	.15	8.92	10.75	10.68	11.09	8.77	9.29	8.92	11.43	17.48	16.48	21.58	20.83
St. Paul**	.15	8.99	9.74	10.99	11.16	8.83	9.33	8.97	11.64	.....	16.69	.....	21.04

Base Quantities (Standard unless otherwise keyed): Cold finished bars: 2000 lb or over. Alloy bars: 1000 to 1999 lb. All others: 2000 to 4999 lb. All HR products may be combined for quantity. All galvanized sheets may be combined for quantity. CR sheets may be combined with each other for quantity. ** These cities are on net pricing. Prices shown are for 2000 lb item quantities of the following: Hot-rolled sheet—10 ga. x 36 x 96—120; Cold-rolled sheet—20 ga x 36 x 96—120; Galv. sheet—10 ga x 36—120; Hot-rolled strip—¼" x 1"; Plate—¼" x 84"; Shapes—I-Beams 6 x 12.5; Hot-rolled bar—Rounds—⅝-2 15/16; Cold-finished bar—C 1018—1" rounds; Alloy bar—hot-rolled 4615—1⅝" to 2⅞"; cold drawn—15/16" to 2⅞" round; Hot-rolled 4140—⅝" to 2⅞" round, cold drawn—15/16" to 2⅞" round.

†† 1.3¢ zinc. ‡ Deduct for country delivery. [1] 15 ga. & heavier; [2] 14 ga. & lighter. [3] 10 ga. x 48 — 120.

(Effective Sept. 2, 1960)

PIG IRON

Dollars per gross ton, f.o.b., subject to switching charges.

Producing Point	Basic	Fdry.	Mall.	Bess.	Low Phos.
Birdsboro, Pa. *B6*	68.00	68.50	69.00	69.50	73.00
Birmingham *R3*	62.00	62.50*	.....	.....	.....
Birmingham *W9*	62.00	62.50*	66.50	.....	.....
Birmingham *U4*	62.00	62.50*	66.50	.....	.....
Buffalo *R3*	66.00	66.50	67.00	67.50	.....
Buffalo *H1*	66.00	66.50	67.00	67.50	71.50†
Buffalo *W6*	66.00	66.50	67.00	67.50	.....
Chester *P2*	68.00	68.50	69.00	.....	.....
Chicago *I4*	66.00	66.50	66.50	67.00	.....
Cleveland *A5*	66.00	66.50	66.50	67.00	71.00†
Cleveland *R3*	66.00	66.50	66.50	67.00	.....
Duluth *I4*	66.00	66.50	66.50	67.00	71.00†
Erie *I4*	66.00	66.50	66.50	67.00	71.00†
Fontana *K1*	75.00	75.50	.....	.....	.....
Geneva, Utah *C7*	66.00	66.50	.....	.....	.....
Granite City *G2*	67.90	68.40	68.90	.....	.....
Hubbard *Y1*	.....	.....	66.50	.....	.....
Ironton, Utah *C7*	66.00	66.50	.....	.....	.....
Lyles, Tenn. *T3*	.....	.....	.....	.....	73.00
Midland *C11*	66.00	.....	.....	.....	.....
Minnequa *C6*	68.00	68.50	69.00	.....	.....
Monessen *P6*	66.00	.....	.....	.....	.....
Neville Is. *P4*	66.00	66.50	66.50	67.00	71.00†
N. Tonawanda *T1*	.....	66.50	67.00	67.50	.....
Rockwood *T3*	62.00	62.50	66.50	67.00	73.00
Sharpsville *S3*	66.00	.....	66.50	67.00	.....
So. Chicago *R3*	66.00	66.50	66.50	67.00	.....
So. Chicago *W8*	66.00	.....	66.50	67.00	.....
Swedeland *A2*	68.00	68.50	69.00	69.50	73.00†
Toledo *I4*	66.00	66.50	66.50	67.00	.....
Troy, N. Y. *R3*	68.00	68.50	69.00	69.50	73.00
Youngstown *Y1*	.....	.....	66.50	.....	.....

DIFFERENTIALS: Add, 75¢ per ton for each 0.25 pct silicon or portion thereof over base (1.75 to 2.25 pct except low phos., 1.75 to 2.00 pct) 50¢ per ton for each 0.25 pct manganese or portion thereof over 1 pct, $2 per ton for 0.50 to 0.75 pct nickel, $1 for each additional 0.25 pct nickel. Add $1.00 for 0.31-0.69 pct phos. Add 50¢ per gross ton for truck loading charge.

♪Silvery Iron: Buffalo (6 pct), *H1*, $79.25; Jackson *J1, I4*, (Globe Dir.), $78.00; Niagara Falls (15.01-15.50), $101.00; Keokuk (14.01-14.50), $89.00; (15.51-16.00), $92.00. Add 75¢ per ton for each 0.50 pct silicon over base (6.01 to 6.50 pct) up to 13 pct. Add $1.00 for each 0.50 pct manganese over 1.00 pct.

† Intermediate low phos.

FASTENERS

(Base discounts, f.o.b. mill, based latest list prices)

Hex Screws and All Bolts Including Hex & Hex, Square Machine, Carriage, Lag, Plow, Step, and Elevator

(Discount for 1 container) — *Pct*

Plain finish—packaged and bulk.	50
Hot galvanized and zinc plated—packaged	43.75
Hot galvanized and zinc plated—bulk	50

Nuts: Hexagon and Square, Hex, Heavy Hex, Thick Hex & Square

(Discount for 1 container) — *Pct*

Plain finish—packaged and bulk.	50
Hot galvanized and zinc plated—packaged	43.75
Hot galvanized and zinc plated—bulk	50

Hexagon Head Cap Screws—UNC or UNF Thread—Bright & High Carbon

(Discount for 1 container)

Plain finish—packaged and bulk.	50
Hot galvanized and zinc plated—packaged	43.75
Hot galvanized and zinc plated—bulk	50

(On all the above categories add 25 pct for less than container quantities. Minimum plating charge—$10.00 per item. Add 7½ pct for nuts assembled to bolts)

Machine Screws and Stove Bolts

(Packages—plain finish)

	Discount Screws	Bolts
Full Cartons	46	46
Machine Screws—bulk		
¼ in. diam or smaller	25,000 pcs	50
5/16, ⅜ & ½ in. diam	15,000 pcs	50

STAINLESS STEEL

Base price cents per lb. f.o.b. mill

Product	201	202	301	302	303	304	316	321	347	403	410	416	430
Ingots, reroll.	22.75	24.75	24.00	26.25	—	28.00	41.25	33.50	38.50	—	17.50	—	17.75
Slabs, billets	28.00	31.50	29.00	32.75	33.25	34.50	51.25	41.50	48.25	—	22.25	—	22.50
Billets, forging	—	37.75	38.75	39.50	42.50	42.00	64.50	48.75	57.75	29.25	29.25	29.75	29.75
Bars, struct.	43.50	44.50	46.00	46.75	49.75	49.50	75.75	57.50	67.25	35.00	35.00	35.50	35.50
Plates	39.25	40.00	41.25	42.25	45.00	45.75	71.75	54.75	64.75	30.00	30.00	31.25 31.75	31.00
Sheets	48.50	49.25	51.25	52.00	56.75	55.00	80.75	65.50	79.25	40.25	40.25	48.25	40.75
Strip, hot-rolled	36.00	39.00	37.25	40.50	—	43.75	68.50	53.50	63.50	—	31.00	—	32.00
Strip, cold-rolled	45.00	49.25	47.50	52.00	56.75	55.00	80.75	65.50	79.25	40.25	40.25	42.50	40.75
Wire CF; Rod HR	—	42.25	43.50	44.25	47.25	47.00	71.75	54.50	63.75	33.25	33.25	33.75	33.75

STAINLESS STEEL PRODUCING POINTS:

Sheets: Midland, Pa., *C11;* Brackenridge, Pa., *A3;* Butler, Pa., *A7;* Vandergrift, Pa., *U1;* Washington, Pa., *W2, J2;* Baltimore, *E1;* Middletown, O., *A7;* Massillon, O., *R3;* Gary, *U1;* Bridgeville, Pa., *U2;* New Castle, Ind., *I2;* Detroit, *M2;* Louisville, O., *R5.*

Strip: Midland, Pa., *C11;* Waukegan, Cleveland, *A5;* Carnegie, Pa., *S9;* McKeesport, Pa., *F1;* Reading, Pa., *C2;* Washington, Pa., *W2;* W. Leechburg, Pa., *A3;* Bridgeville Pa., *U2;* Detroit, *M2;* Detroit, *S1;* Canton, Massillon, O., *R3;* Harrison, N. J., *D3;* Youngstown. *R5;* Sharon, Pa., *S1;* Butler, Pa., *A7;* Wallingford, Conn., *U3* (plus further conversion extras); *W1* (25¢ per lb. higher); Seymour, Conn., *S13,* (25¢ per lb. higher); New Bedford, Mass., *R6* Gary, *U1,* (25¢ per lb. higher); Baltimore, Md., *E1* (300 series only).

Bar: Baltimore, *A7;* S. Duquesne, Pa., *U1;* Munhall, Pa., *U1;* Reading, Pa., *C2;* Titusville, Pa., *U2;* Washington, Pa., *J2;* McKeesport, Pa., *U1, F1;* Bridgeville, Pa., *U2;* Dunkirk, N. Y., *A3;* Massillon, O., *R5;* S. Chicago, *U1;* Syracuse, N. Y., *C11;* Watervliet, N. Y., *A3;* Waukegan, *A5;* Canton, O., *T5, R3;* Ft. Wayne, *I4;* Detroit, *R5;* Gary, *U1;* Owensboro, Ky., *G5;* Bridgeport, Conn., *N8;* Ambridge, Pa., *B7.*

Wire: Waukegan, *A5;* Massillon, O., *R3;* McKeesport, Pa., *F1;* Ft. Wayne, *J4;* Newark, N. J. *D2;* Harrison, N. J., *D3;* Baltimore, *A7;* Dunkirk, *A3;* Monessen, *P1;* Syracuse, *C11;* Bridgeville, *U2;* Detroit, *R5;* Reading, Pa., *C2;* Bridgeport, Conn., *N8* (down to and including ¼").

Structurals: Baltimore, *A7;* Massillon, O., *R3;* Chicago, Ill., *J4;* Watervliet, N. Y., *A3;* Syracuse, *C11;* S. Chicago, *U1.*

Plates: Ambridge, Pa., *B7;* Baltimore, *E1;* Brackenridge, Pa., *A3;* Chicago, *U1;* Munhall, Pa., *U1;* Midland, Pa., *C11;* New Castle, Ind., *I2;* Middletown, *A7;* Washington, Pa., *J2;* Cleveland, Massillon, *R3;* Coatesville, Pa., *C15;* Vandergrift, Pa., *U1;* Gary, *U1.*

Forging billets: Ambridge, Pa., *B7;* Midland, Pa., *C11;* Baltimore, *A7;* Washington, Pa., *J2;* McKeesport, *F1;* Massillon, Canton, O., *R3;* Watervliet, *A3;* Pittsburgh, Chicago, *U1;* Syracuse, *C11;* Detroit, *R5;* Munhall, Pa., S. Chicago, *U1;* wensboro, Ky., *G5;* Bridgeport, Conn., *N8;* Reading, Pa., *C2.*

Machine Screw and Stove Bolt Nuts

(Packages—plain finish)

	Discount Hex	Square
Full Cartons	46	57
Bulk		
¼ in. diam or smaller	25,000 pcs	
5/16 or ⅜ in. diam	56	60
	15,000 pcs	
	56	60

Rivets

	Base per 100 *lb*
½ in. diam and larger	$12.85
	Pct Off List
7/16 in. and smaller	15

TOOL STEEL

F.o.b. mill

W	Cr	V	Mo	Co	per lb	SAE
18	4	1	—	—	$1.84	T-1
18	4	1	—	5	2.545	T-4
18	4	2	—	—	2.005	T-2
1.5	4	1.5	8	—	1.20	M-1
6	4	2	6	—	1.59	M-3
6	4	2	5	—	1.345	M-2
High-carbon chromium					.955	D-3, D-5
Oil hardened manganese					.505	O-2
Special carbon					.38	W-1
Extra carbon					.38	W-1
Regular carbon					.325	W-1

Warehouse prices on and east of Mississippi are 4¢ per lb higher. West of Mississippi, 6¢ higher.

LAKE SUPERIOR ORES

51.50% Fe natural, delivered lower Lake ports. Interim prices for 1960 season. Freight changes for seller's account.

	Gross Ton
Openhearth lump	$12.70
Old range, bessemer	11.85
Old range, nonbessemer	11.70
Mesabi, bessemer	11.60
Mesabi, nonbessemer	11.45
High phosphorus	11.45

(Effective Sept. 2, 1960)

MERCHANT WIRE PRODUCTS

F.o.b. Mill	Standard & Coated Nails	Woven Wire Fence	"T" Fence Posts	Single Loop Bale Ties	Galv. Barbed and Twisted Barbless Wire	Merch. Wire Ann'ld ¢/lb.	Merch. Wire Galv. ¢/lb.
	Col	Col	Col	Col	Col		
Alabama City *R3*	173	187	...	212	193	9.00	9.55
Aliquippa *J3***	173	190	.....	190	9.00	9.675	
Atlanta *A8***	173	191	...	212	197	9.00	9.75
Bartonville *K2***	175	193	183	214	199	9.10	9.85
Buffalo *W6*	.....	.....	.....	.....	.....	9.00	9.55*
Chicago *N4*	173	191	177	212	197	9.00	9.75
Chicago *R3*	.....	.....	.....	.....	.....	9.00	9.55
Cleveland *A6*	.....	.....	.....	.....	.....	.....	.....
Cleveland *A5*	.....	.....	.....	.....	.....	9.00	.....
Crawf'dsv. *M4***	175	193	...	214	199	9.10	9.85
Donora, Pa. *A5*	173	187	...	212	193	9.00	9.55
Duluth *A5*	173	187	177	212	193	9.00	9.55
Fairfield, Ala. *T2*	173	187	...	212	193	9.00	9.55
Galveston *D4*	9.10‡	.....	.....	.....	.....	.....	.....
Houston *S2*	178	192	...	217	198	9.25	9.80†
Jacksonville *M4*	184-1	197	...	219	203	9.10	9.775
Johnstown *B3***	173	190	177	...	196	9.00	9.675
Joliet, Ill. *A5*	173	187	...	212	193	9.00	9.55
Kokomo *C9**	175	189	...	214	195*	9.10	9.65*
L. Angeles *B2****	.....	.....	.....	.....	.....	9.95	10.625
Kansas City *S2**	178	192	...	217	198*	9.25	9.80†
Minnequa *C6*	178	192	182	217	198†	9.25	9.80†
Palmer, Mass. *W6*	.....	.....	.....	.....	.....	9.30	9.85*
Pittsburg, Cal. *C7*	192	210	.....	.....	213	9.95	10.50
Rankin Pa. *A5*	173	187	.....	.....	193	9.00	9.55
So. Chicago *R3*	173	187	.....	.....	193	8.65	9.20
S. San Fran. *C6*	.....	.....	.....	236	.....	9.95	10.50
Sparrows Pt. *B3***	175	.....	.....	215	198	9.10	9.775
Struthers, O. *Y1**	.....	.....	.....	.....	.....	8.65	9.20
Worcester *A5*	179	.....	.....	.....	.....	9.30	9.85
Williamsport *S5*	.....	.....	.....	.....	.....	.....	.....

* Zinc less than .10¢. *** .10¢ zinc.
** 13-13.5¢ zinc. † Plus zinc extras.
‡ Wholesalers only.

PIPE AND TUBING

Base discounts (pct) f.o.b. mills. Base price about $290 per net ton

STANDARD T. & C.	BUTTWELD														SEAMLESS							
	⅛ In.		¾ In.		1 In.		1¼ In.		1½ In.		2 In.		2½–3 In.		2 In.		2½ In.		3 In.		3½–4 In.	
	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.
Sparrows Pt. *B3*	0.25	*15.0	3.25	*11.0	6.75	*6.50	9.25	*5.75	9.75	*4.75	10.25	*4.25	11.75	*4.50	.....	.....	.....	.....	.....	.....	.....	.....
Youngstown *R3*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50	.....	.....	.....	.....	.....	.....	.....	.....
Fontana *K1*	*10.75	*26.00	*7.75	*22.00	*4.25	*17.50	*1.75	*16.75	*1.25	*15.75	*0.75	*15.25	0.75	*15.50	.....	.....	.....	.....	.....	.....	.....	.....
Pittsburgh *J3*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50	*12.25	*27.25	*5.75	*22.50	*3.25	*20.0	*1.75	*18.50
Alton, Ill. *L1*	0.25	*15.0	3.25	*11.0	6.75	*6.50	9.25	*5.75	9.75	*4.75	10.25	*4.25	11.75	*4.50	.....	.....	.....	.....	.....	.....	.....	.....
Sharon *M3*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50	.....	.....	.....	.....	.....	.....	.....	.....
Fairless *N2*	0.25	*15.0	3.25	*11.0	6.75	*6.50	9.25	*5.75	9.75	*4.75	10.25	*4.25	11.75	*4.50	.....	.....	.....	.....	.....	.....	.....	.....
Pittsburgh *N1*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50	*12.25	*27.25	*5.75	*22.50	*3.25	*20.0	*1.75	*18.50
Wheeling *W5*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50	.....	.....	.....	.....	.....	.....	.....	.....
Wheatland *W4*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50	.....	.....	.....	.....	.....	.....	.....	.....
Youngstown *Y1*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50	*12.25	*27.25	*5.75	*22.50	*3.25	*20.0	*1.75	*18.50
Indiana Harbor *Y1*	1.25	*14.0	4.25	*10.0	7.75	*5.50	10.25	*4.75	10.75	*3.75	11.25	*3.25	12.75	*3.50	.....	.....	.....	.....	.....	.....	.....	.....
Lorain *N2*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50	*12.25	*27.25	*5.75	*22.50	*3.25	*20.0	*1.75	*18.50
EXTRA STRONG PLAIN ENDS																						
Sparrows Pt. *B3*	4.75	*9.0	8.75	*5.0	11.75	*0.50	12.25	*1.75	12.75	*0.75	13.25	*0.25	13.75	*1.50	.....	.....	.....	.....	.....	.....	.....	.....
Youngstown *R3*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	.....	.....	.....	.....	.....	.....	.....	.....
Fairless *N2*	4.75	*9.0	8.75	*5.0	11.75	*0.50	12.25	*1.75	12.75	*0.75	13.25	*0.25	13.75	*1.50	.....	.....	.....	.....	.....	.....	.....	.....
Fontana *K1*	*6.25	.....	*2.25	.....	0.75	.....	1.25	.....	1.75	.....	2.25	.....	2.75	.....	.....	.....	.....	.....	.....	.....	.....	.....
Pittsburgh *J3*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	*10.75	*24.75	*3.25	*19.0	*0.75	*16.50	4.25	*11.50
Alton, Ill. *L1*	4.75	*9.0	8.75	*5.0	11.75	*0.50	12.25	*1.75	12.75	*0.75	13.25	*0.25	13.75	*1.50	.....	.....	.....	.....	.....	.....	.....	.....
Sharon *M3*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	.....	.....	.....	.....	.....	.....	.....	.....
Pittsburgh *N1*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	*10.75	*24.75	*3.25	*19.0	*0.75	*16.50	4.25	*11.50
Wheeling *W5*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	.....	.....	.....	.....	.....	.....	.....	.....
Wheatland *W4*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	.....	.....	.....	.....	.....	.....	.....	.....
Youngstown *Y1*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	*10.75	*24.75	*3.25	*19.0	*0.75	*16.50	4.25	*11.50
Indiana Harbor *Y1*	5.75	*8.0	9.75	*4.0	12.75	0.50	13.25	*0.75	13.75	0.25	14.25	0.75	14.75	*0.50	.....	.....	.....	.....	.....	.....	.....	.....
Lorain *N2*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	*10.75	*24.75	*3.25	*19.0	*0.75	*16.50	4.25	*11.50

Threads only, buttweld and seamless, 2¼ pt. higher discount. Plain ends, buttweld and seamless, 3-in. and under, 5½ pt. higher discount.
Galvanized discounts based on zinc price range of over 9¢ to 11¢ per lb. East St. Louis. For each 2¢ change in zinc, discounts vary as follows: ⅛, ¾ and 1-in., 2 pt.; 1¼, 1½ and 2-in., 1½ pt.; 2½ and 3-in., 1 pt., e.g., zinc price range of over 13¢ to 15¢ would lower discounts on 2½ and 3-in. pipe by 2 points; zinc price in range over 7¢ to 9¢ would increase discounts. East St. Louis zinc price now 13.00¢ per lb.

CAST IRON WATER PIPE INDEX

Birmingham	135.8
New York	138.5
Chicago	139.8
San Francisco-L. A.	148.6

Dec. 1955, value, Class B or heavier 6 in. or larger, bell and spigot pipe. Explanation: p. 57, Sept. 1, 1955, issue. Source: U. S. Pipe and Foundry Co.

COKE

Furnace, beehive (f.o.b.)	Net-Ton
Connellsville, Pa.	$14.75 to $15.50
Foundry, beehive (f.o.b.)	$18.50
Foundry oven coke	
Buffalo, del'd	$33.25
Chattanooga, Tenn.	30.80
Ironton, O., f.o.b.	30.50
Detroit, f.o.b.	32.00
New England, del'd	33.55
New Haven, f.o.b.	31.00
Kearny, N. J., f.o.b.	31.25
Philadelphia, f.o.b.	31.00
Swedeland, Pa., f.o.b.	31.00
Painesville, Ohio, f.o.b.	32.00
Erie, Pa., f.o.b.	32.00
St. Paul, f.o.b.	31.25
St. Louis, f.o.b.	33.00
Birmingham, f.o.b.	30.35
Milwaukee, f.o.b.	32.00
Neville Is., Pa.	30.75

Steel Warehouse Equipment — For Sale

SLITTING LINES COMPLETE

72" Paxon, Uncl., Recl., 75 HP MG Set, Knives & Spacers, '52.
48" Paxon, Uncl., Recl., 50 HP MG Set, Knives & Spacers, '50.
36" Paxon, Uncl., Recl., 50 HP MG Set, Knives & Spacers, '48.

Littell #25-12 Uncoiler and Recoiler, 12" face, 2500# coil capacity, 1952.
(5) Cluster Mills, 6" width, roller bearings, single and double drive Recoilers, rebuilt.
(6) 2 Hi Mills 6"-10" wide, roller bearings, single and double drive, rebuilt.
Other Equipment Includes: Roller Levellers, 72" Coil Cradle, Continuous Strip Polishing Line, Cut Up Lines, 10" x 3/16" Niagara Shear, Several other shears in various sizes, Yard Crane, Small Slitters, etc.
For further information contact—

MANDEL-CAMRAS MACHINERY CO. INC.
1328 W. RANDOLPH ST. CHICAGO 7, ILLINOIS
MOnroe 6-2177

GOSS and DE LEEUW
MULTIPLE SPINDLE
CHUCKING MACHINES
Tool Rotating
GOSS & DE LEEUW MACHINE CO., KENSINGTON, CONN.

FORGINGS
ALL SIZES, pressed . . rolled . . extruded . . forged to accurate specifications from carbon, alloy, stainless steels and special metals. Modern metallurgical, die, heat-treating and rough machining facilities.
Over 50 years of forging design and development
THE CANTON DROP FORGING & MFG. CO.
CANTON, OHIO

VALUABLE REFERENCE

free
84-PAGE CATALOG
One Complete Source of Detailed Specifications for Designers, Production Managers, Toolroom Foremen

Hundreds of NEW ITEMS

ALL NEW — Complete specifications and cost saving data on over 2000 "Standards", including world's largest line of workholding equipment, chuck jaw blanks, handles, knobs, wheels, strap clamp assemblies, forged items, plus hundreds of other jig and fixture components. Detailed specifications, engineering drawings. The one complete source for data on all the "standards" for tool, die, jig, and fixture design and application.
Write for your FREE copy today.

JERGENS TOOL SPECIALTY CO.
Dept. I-9, 712 E. 163rd St., Cleveland 10, Ohio

RAILS, TRACK SUPPLIES

F.o.b. Mill Cents Per Lb	No. 1 Std. Rails	Light Rails	Joint Bars	Track Spikes	Tie Plates	Track Bolts Untreated
Bessemer *UI*	5.75	6.725	7.25	....	....	....
Cleveland *R3*	....	....	....	....	....	15.35
So. Chicago *R3*	....	....	....	10.10	....	....
Ensley *T2*	5.75	6.725	....	....	....	....
Fairfield *T2*	....	6.725	....	10.10	6.875	....
Gary *UI*	5.75	....	....	....	6.875	....
Huntington, *CI6*	....	6.725	....	....	....	....
Ind. Harbor *I3*	....	....	....	10.10	....	....
Johnstown *B3*	....	6.725	....	....	....	....
Joliet *UI*	....	....	7.25	....	....	....
Kansas City *S2*	....	....	....	10.10	....	15.35
Lackawanna *B3*	5.75	6.725	7.25	....	6.875	....
Lebanon *B3*	....	....	7.25	....	....	15.35
Minnequa *C6*	5.75	7.225	7.25	10.10	6.875	15.35
Pittsburgh *S14*	....	....	....	....	....	15.35
Pittsburgh *J3*	....	....	....	10.10	....	....
Seattle *B2*	....	....	....	....	6.75	15.85
Steelton *B3*	5.75	....	7.25	....	6.875	....
Struthers *Y1*	....	....	....	10.10	....	....
Torrance *C7*	....	....	....	....	6.75	....
Williamsport *S5*	....	6.725	....	....	....	....
Youngstown *R3*	....	....	....	10.10	....	....

C-R SPRING STEEL

Cents Per Lb F.o.b. Mill	CARBON CONTENT 0.26–0.40	0.41–0.60	0.61–0.80	0.81–1.05	1.06–1.35
Anderson, Ind. *G4*	8.95	10.40	12.60	15.60	18.55
Baltimore, Md. *T8*	9.50	10.70	12.90	15.90	18.85
Bristol, Conn. *W12*	....	10.70	12.90	16.10	19.30
Boston *T8*	9.50	10.70	12.90	15.90	18.85
Buffalo, N. Y. *R7*	8.95	10.40	12.60	15.60	18.55
Carnegie, Pa. *S9*	8.95	10.40	12.60	15.60	18.55
Cleveland *A5*	8.95	10.40	12.60	15.60	18.55
Dearborn *S1*	9.05	10.50	12.70	....	....
Detroit *D1*	9.05	10.50	12.70	15.70	....
Detroit *D2*	9.05	10.50	12.70	....	....
Dover, O. *G4*	8.95	10.40	12.60	15.60	18.55
Evanston, Ill. *M8*	9.65	10.40	12.60	15.60	....
Franklin Park, Ill. *T8*	9.05	10.40	12.60	15.60	18.55
Harrison, N. J. *C11*	....	....	12.90	16.10	19.30
Indianapolis *R5*	9.10	10.55	12.60	15.60	18.55
Los Angeles *C1*	11.15	12.60	14.80	17.80	....
New Britain, Conn. *S7.8*	9.40	10.70	12.90	15.90	18.85
New Castle, Pa. *B4*	8.95	10.40	12.60	15.60	....
New Castle, Pa. *M10*	8.95	10.40	12.60	15.60	....
New Haven, Conn. *D1*	9.40	10.70	12.90	15.90	....
Pawtucket, R. I. *N7*	9.50	10.70	12.90	15.90	18.85
Riverdale, Ill. *A1*	9.05	10.40	12.60	15.60	18.55
Sharon, Pa. *S1*	8.95	10.40	12.60	15.60	18.55
Trenton, *R4*	....	10.70	12.90	16.10	19.30
Warren, Ohio *T4*	8.95	10.40	12.60	15.60	18.75
Worcester, Mass. *A5*	9.50	10.70	12.90	15.90	18.85
Youngstown *R5*	9.10	10.55	12.60	15.60	18.55

ELECTROPLATING SUPPLIES

Anodes

(Cents per lb, frt allowed in quantity)

Copper

Rolled elliptical, 18 in. or longer, 5000 lb lots 48.00

Electrodeposited, 5000 lb lots ... 39.50

Brass, 80-20, ball anodes, 2000 lb or more 53.00

Zinc, ball anodes, 2000 lb lots 20.50
(for elliptical add 1¢ per lb)

Nickel, 99 pct plus, rolled carbon, 5000 lb 1.0225
(Rolled depolarized add 3¢ per lb)

Cadmium, 5000 lb 1.40

Tin, ball anodes $1.05 per lb (approx.).

Chemicals

(Cents per lb, f.o.b. shipping point)

Copper cyanide, 100 lb drum..... 65.90

Copper sulphate, 25.2 Cu min, 6000 to 12,000 lbs per cwt $13.75

Nickel sulfate, 5000 to 23,000 lbs... 29.00

Nickel chloride, freight allowed, 100 lb 45.00

Sodium cyanide, domestic, f.o.b. Chicago, 200 lb drums 25.00

Zinc cyanide, 100 lb 60.75

Potassium cyanide, 100 lb drum N. Y. 45.50

Chromic acid, flake type, 10,000 lb or more 30.44

METAL POWDERS

(Cents per lb, f.o.b. shipping point for ton lots or over, except as noted)

Iron Powders

Molding grade, domestic and foreign, 98 pct Fe, 100 mesh bags, freight allowed east of Miss. R. 11.50

Electrolytic Iron, melting stock, 99.87 pct Fe, truckload lots 25.75

Carbonyl Iron (200 lb lots) 88.00

Welding Grades 8.10

Cutting and Scarfing Grades 9.85

Hydrogen reduced, domestic 11.25

Copper Powders

Molding Grades

Electrolytic, domestic, f.o.b. shipping point. 15.00†

Atomized ..... 46.5 to 64.5

Reduced ..... 15.00†

Chemically Precipitated 15.00†

Brass, 5000-lb lots ..... 35.1 to 52.2

Bronze, 5000-lb lots ..... 53.1 to 56.7

Chromium, electrolytic 5.00

Lead ..... 7.50†

Manganese, electrolytic ... $1.00

Molybdenum .....$3.60 to $4.35

Nickel $1.15

Carbonyl Nickel, 20,000 lb lots $1.01

Nickel-Silver, 5000 lb lots.. 60.7 to 69.0

Silicon 70.00

Solder ..... 7.00†

Stainless Steel, 316 ..... $1.07

Stainless steel 304 ..... 89.00

Tin ..... 14.00†

Titanium, 99.25 + pct, per lb, f.o.b. $11.25

Tungsten .....$3.15 (nominal)

† Plus cost of metal.

ELECTRICAL SHEETS

22-Gage F.o.b. Mill Cents Per Lb	Hot-Rolled (Cut Lengths)*	Cold-Reduced (Coiled or Cut Length) Semi-Processed	Fully Processed
Field	....	9.875	....
Armature	11.70	11.20	11.70
Elect.	12.40	11.90	12.40
Special Motor	....	12.475	....
Motor	13.55	13.05	13.55
Dynamo	14.65	14.15	14.65
Trans. 72	15.70	15.20	15.70
Trans. 65	16.30	Grain Oriented	
Trans. 58	16.80	Trans. 80	19.70
Trans. 52	17.85	Trans. 73	20.20
		Trans. 66	20.70

Producing points: Aliquippa (*J3*); Beech Bottom (*W5*); Brackenridge (*A3*); Granite City (*G2*); Indiana Harbor (*I3*); Mansfield (*E2*); Newport, Ky. (*A9*); Niles, O. (*S1*); Vandergrift (*U1*); Warren, O. (*R3*); Zanesville, Butler (*A7*).

CLAD STEEL

Base prices, cents per lb f.o.b.

	Cladding	Plate (*L4, C4, A3, J2*) 10 pct	15 pct	20 pct	Sheet (*I2*) 20 pct
Stainless Type	302	....	....	....	37.50
	304	28.80	31.55	34.30	40.00
	316	42.20	46.25	50.25	58.75
	321	34.50	37.75	41.05	47.25
	347	40.80	44.65	48.55	57.00
	405	24.60	26.90	29.25	....
	410	22.70	24.85	27.00	....
	430	23.45	25.65	27.90	....

CR Strip (*S9*) Copper, 10 pct, 2 sides, 44.20; 1 side, 36.80.

(Effective Sept. 2, 1960)

REFRACTORIES

Fire Clay Brick

Carloads per 1000

Super duty, Mo., Pa., Md., Ky.... $185.00

High duty (except Salina, Pa., add $5.00) 140.00

Medium duty 125.00

Low duty (except Salina, Pa., add $2.00) 103.00

Ground fire clay, net ton, bulk... 22.50

Silica Brick

Mt. Union, Pa., Ensley, Ala. $158.00

Childs, Hays, Latrobe, Pa. 163.00

Chicago District 168.00

Western Utah 183.00

California 165.00

Super Duty
Hays, Pa., Athens, Tex., Windham, Warren, O., Morrisville 163.00-168.00

Silica cement, net ton, bulk, Latrobe 29.75

Silica cement, net ton, bulk, Chicago 26.75

Silica cement, net ton, bulk, Ensley, Ala. 27.75

Silica cement, net ton, bulk, Mt. Union 25.75

Silica cement, net ton, bulk, Utah and Calif. 39.00

Chrome Brick *Per net ton*

Standard chemically bonded, Balt.$109.00

Standard chemically bonded, Curtiner, Calif. 119.00

Burned, Balt. 103.00

Magnesite Brick

Standard, Baltimore $140.00

Chemically bonded, Baltimore 119.00

Grain Magnesite St. ⅝ to ½-in. grains

Domestic, f.o.b. Baltimore in bulk. $73.00

Domestic, f.o.b. Chewalah, Wash., Luning, Nev.
in bulk 46.00
in sacks 52.00-54.00

Dead Burned Dolomite *Per net ton*

F.o.b. bulk, producing points in:
Pa., W. Va., Ohio $16.75
Missouri Valley 15.60
Midwest 17.00

ELECTRODES

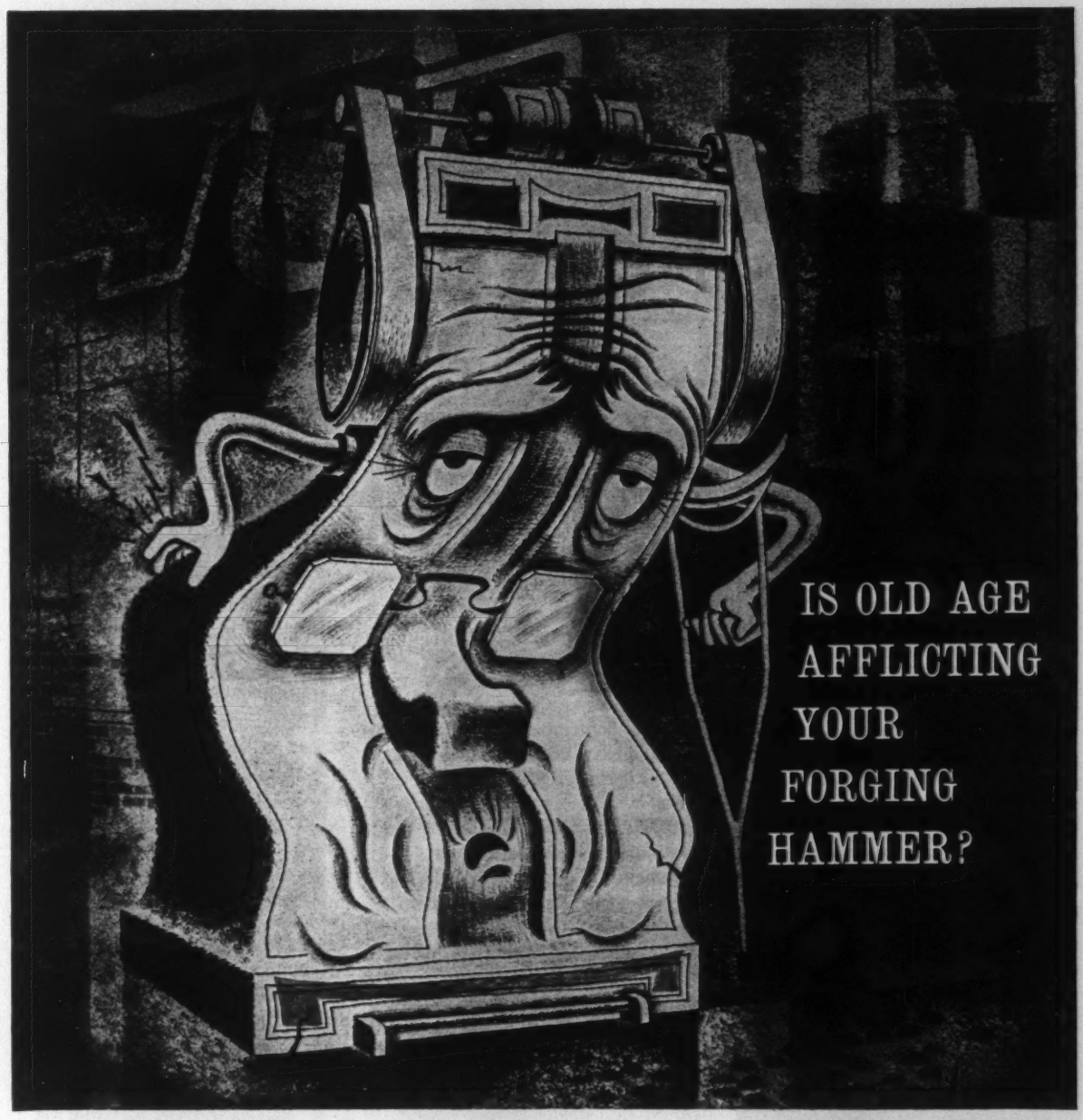
Cents per lb. f.o.b. plant, threaded, with nipples, unboxed.

GRAPHITE Diam. (In.)	Length (In.)	Price	CARBON* Diam. (In.)	Length (In.)	Price
24	84	27.25	40	100, 110	12.50
20	72	26.50	35	110	11.20
18	72	27.50	30	110	11.70
14	72	27.25	24	72	11.95
12	72	28.25	20	90	11.55
10	60	29.50	17	72	12.10
10	48	30.00	14	72	12.55
7	60	29.75	10	60	13.80
6	60	33.25	8	60	14.25
4	40	37.00			
3	40	39.25			
2½	30	41.50			
2	24	64.00			

* Prices shown cover carbon nipples.

BOILER TUBES

$ per 100 ft. carload lots cut 10 to 24 ft. F.o.b. Mill	Size OD-In.	B.W. Ga.	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.
Babcock & Wilcox..	2	13	40.28	47.21	35.74
	2½	12	54.23	63.57	48.13
	3	12	62.62	73.40	55.59
	3½	11	73.11	85.70	65.84
	4	10	97.08	113.80	88.10
National Tube.....	2	13	40.28	47.21	35.74
	2½	12	54.23	63.57	48.13
	3	12	62.62	73.40	55.59
	3½	11	73.11	85.70	65.84
	4	10	97.08	113.80	88.10
Pittsburgh Steel...	2	13	40.28	47.21	.....
	2½	12	54.23	63.57	.....
	3	12	62.62	73.40	.....
	3½	11	73.11	85.70	.....
	4	10	97.08	113.80	.....



Add years to your hammer's life; improve performance with ERIE FOUNDRY REBUILDING SERVICE

Here at Erie Foundry we rejuvenate "old" forging hammers. First, we re-machine worn surfaces, true bearings, replace broken parts, repair cracked parts. Once the hammer is reassembled, tested and put back in operation, it's as spry and sound as a new machine—but at one-third the cost!

Stands to reason that the leaders in forge manufacture for over 60 years should be the best source for forge repair.

Regardless of who made it, or how badly it's cracked, broken or worn, your forging hammer will recover most quickly at Erie Foundry's Rebuilding "Hospital." Write for the complete story.

Manufacturers of Forging Hammers • Forging Presses • Hydraulic Presses • Trimming Presses

ERIE

ONE OF THE GREAT NAMES
IN FORGING SINCE 1895

ERIE FOUNDRY CO., Erie, Pa.

EF-60-02

VARIABLE VOLTAGE DRIVES
3 PHASE 60 CYCLE

Quan.	Size	Description
2	3000 HP	DC MOTORS—525 V. 600 RPM Whse. M. G. Sets—2500 K.W. Whse., 2300/4160 V.
1	2750 HP	DC MOTOR 450 V. 300 RPM Elliott 2200 K.W., Gen. Elec. 3 unit 450 V. DC Gen. with 3000 H.P. 720 RPM, 2300 V. AC Motor and Etc.
1	2250 HP	DC MOTOR 600 V. 400/500 RPM, G.E. M.G. Set—2000 K.W. G.E. AC Motor—2300 V.
1	1500 HP	DC MOTOR 600 V. 600 RPM Whse. M. G. Set. 1500 K.W. G.E. 13,200 V.
1	1500 HP	DC MOTOR 600 V. 300/700 RPM Whse. M.G. Set—1500 K.W. G.E. 13,200 V.

For listing of Motors, Generators, Transformers, M.G. Sets, Rectifiers, Mill Motors, etc.
See last week issue.
Write — Phone — Wire
BELYEA COMPANY, Inc.
47 Howell St., Jersey City, N. J.
Tel. Oldfield 3-3334

RAILWAY EQUIPMENT
USED and RECONDITIONED
RAILWAY CARS and REPAIR PARTS

FLAT CARS
4—50-Ton Capacity, 43' long
Steel Underframe

DIESEL-ELECTRIC LOCOMOTIVES
1, G. E. 25-Ton, 150 H.P., Std. Ga.
3, G. E. 44-Ton, 400 H.P., Std. Ga.
1, G. E. 80-Ton, 500 H.P., Std. Ga.
1, BALDWIN, 120-Ton, 1000 H.P., Std. Ga.

IRON & STEEL PRODUCTS, INC.
13496 S. Brainard Ave. Chicago 33, Ill. Ph. Mitchell 6-1212
51-8 E. 42nd St. New York 17, N. Y. Ph. YUkon 6-4766

R. R.
EQUIPMENT
HOPPER TANK CABOOSES
FLATS GONDOLAS BOXES
AND SPECIAL DESIGNS

WE WILL REBUILD
TO YOUR SPECIFICATIONS
OR BUILD NEW
AS REQUIRED

RAIL & INDUSTRIAL
EQUIPMENT CO., Inc.
30 CHURCH STREET
NEW YORK 7, N. Y.
PLANT: LANDISVILLE, PA.

Philadelphia Dealers Note Upswing

Used machine dealers around Philadelphia are optimistic. The long-desired upswing appears to have started.

However, it's going to take a solid fourth quarter push if 1960 sales are to equal last year.

▪ Used machine dealers in the Philadelphia area note a slight upswing and hope it's the start of the predicted September sales climb.

One dealer says, "Business has been alright recently, but prior to several weeks ago it was pretty bad." He was quick to add that the situation can still stand great improvement, "But things are getting better and we have hopes it will stay this way."

Several dealers report sales of air compressors, boilers and plant equipment. Some even say these items are selling better than production equipment.

Inquiries Come Through—In Camden, N. J., a dealer is very optimistic after studying his recent "surge of business." He notes that "older inquiries are coming in now." In his area, sales are in a wide range of equipment and it's impossible to pin-point just what is really in demand.

The case in Philadelphia and Camden is not necessarily the national picture. Many dealers have not yet noticed any great sales increase. Nevertheless, most feel it will come soon.

Figures recently released by the Machinery Dealers National Assn. pointed out that July was an even darker month for dealers than June.

Sales Were Down—Dollar sales in July were 22.7 pct lower than June. July sales were also 21.7 pct lower than sales in July, 1959.

Figures on used machine tool sales cover only sales where the ultimate user of the equipment was invoiced and do not include sales to other dealers. Sales of new machines, domestic or foreign, are not included.

The number of machine tools invoiced at $200 or more was also way below last year, taking a dip of 12.5 pct. The dollar value of inventories was up 13.3 pct from July 1959. And the total number of units in inventory was up 41.7 pct.

The final quarter will have to bring a surge of business if this year is to equal 1959 business. Sales in the first quarter were 11.6 pct lower than last year. However, the second quarter saw a 2.7 pct increase.

STAMPING & FORGING EQUIPT.

LATE MODELS—MDNA

MONEY BACK GUARANTEE

1300-Ton Nat'l. Maxipres, 80 SPM, 10" Str., 1955
900-Ton Toledo #60, Bed 47x72, Str. 20" 1943
700/900-Ton Toledo #797E, Bed 127x83, Dbl. Act. Toggle, Air Clutch & Cushion
600-Ton Farracute E601, Coining, Str. 6", 30 SPM, 1950
440-Ton Bliss #210, Bed 37x36, 35 SPM, Side Shear, Str. 16", Mfg. 1953
440-Ton Toledo #59¼, Bed 41x48, Str. 12"
255-Ton Toledo #58½B, Bed 43x42, Str. 12"
150-Ton Cleve. 60-D-84, Bed 86x46, Str. 14"
3000# Chambersburg "Cece Drop" Hammers, 1951

NEW RADIAL DRILLS

4½'x15" MAS-VR4A #4MT, 2500 RPM, Preselection, Hyd. Clamping, program control.
12"x26" MAS-VR103, #6MT, 9' Vert. Cap 5", Hole cap., 20 HP 1400 RPM

PRESSES WANTED

Phone or write Max Wender for top prices on your surplus stamping & forging equipment

WENDER PRESSES Inc.

1957C Clay Detroit 11 Trinity 2-1270

UNIVERSAL Machinery & Equipment Co.

AMERICA'S LARGEST STOCK OF FOUNDRY EQUIPMENT

ARC MELTING FURNACES
250# LECTROMELT—185 KVA
500# LECTROMELT—200 KVA
1000# SWINDELL—500 KVA
2000# SWINDELL—1000 KVA
3000# HEROULT, Door Charge—800 KVA
10' Top Charge Arc Melting Furnace
DETROIT FURNACES—10 lb. to 3000 lb. Cap.

INDUCTION FURNACES
20 KW AJAX Spart Gap 17# Melting
30 KW VACUUM Melting, Complete—Like New
100 KW AJAX Melting Installation—Late
200 KW, 960 cycle, 1000# steel

DUPLEXING ARC FURNACE
Hydroarc Controls

HEAT TREAT FURNACES
4'x4'x10' Gas Fired Box
7' G. E. Rotary Hearth Electric, 1900°F.
36" dia. x 36" deep Electric Recirculating
42" wide roller Hearth 50'L w/atmos. gen.
24"x16'Lx36" 210 KW conveyor. 1400°F.
10"x12"x24" LINDBERG 2500°F. hydrogen

CLEANING EQUIPMENT AND GRINDERS
28x27 WHEELABRATOR *dust*
27x36 WHEELABRATOR w/loader *Collectors*
36x42 WHEELABRATOR w/loader *available*
48x42 WHEELABRATOR w/loader *for all*
WHEELABRATOR No. 1-A Multi Table *machines*
48" WHEELABRATOR Swing Table
72" WHEELABRATOR Swing Table
96" WHEELABRATOR Swing Table
6' LK PANGBORN Table-room
PANGBORN Pipe Cleaner, 2" to 14" O.D.
SAFETY 10 H. Swing Grinder
WHITING 26"x54" tumbling barrel

. . . SPECIAL . . .

15 Ton Double Leg A.C. Gantry Crane
50" Magnet

350 TON MILWAUKEE BRIQUETTING PRESS—Like new with Hydraulic Tamper.

1630 NORTH NINTH ST. READING, PA. PHONE FRANKLIN 3-5103

GIGANTIC 3-DAY

NO LIMIT — NO RESERVE

AUCTION

MONDAY — TUESDAY — WEDNESDAY

SEPT. 26-27-28

STARTING 10 A.M. EACH DAY

FORMER $18,000,000.00 PLANT OF
KAISER MAGNESIUM
METAL MANUFACTURING
Declared Surplus to needs of the U. S. Government

MANTECA, CALIF.
6 MILES SOUTH OF STOCKTON
70 MILES EAST of SAN FRANCISCO

Mill Equip: (3) Raymond 4-roller hi-side mills; Allis Chalmers 5 ft. dia. Ball Mill; Bucket Elevators; Conveyors; Storage Bins to 170 tons.
Pellet & Briquetting: (8) Komarek-Greaves Briquetting Presses; Noble Batch Plant with Aut'm'c Weighing Equip.; Screw & Troughing Conveyors; Elevators; Dust Collecting Systems, etc.
$450,000.00 Gages and Meters with fully equipped Laboratory, Vacuum Gauges, Potentionmeters, Mercury Manometers, etc.
$500,000.00 NEW Supplies, Parts, etc., including 50,000 lbs. Stainless Steel 310 Welding Rod, etc.

MISCELLANEOUS EQUIPMENT: (195) Kinney Hi-Vacuum Pumps; (60) Stokes Rotary Pumps; High Line Dumping System; 400,000 lbs. NEW Steel Shapes and Plate, Foundry, Machine Shop, Handling Equip., etc.

MANTECA, CALIF. 80 - ACRE INDUSTRIAL PROPERTY AUCTION
MONDAY, SEPTEMBER 26th, 1 P.M.
All or in parcels, 300,000 ft. Buildings; 26 acres fenced; R. R. spur; near port, rail, truck, air terminals. Every facility for mfg., warehousing, storage, etc. Broker co-op. invited.

—SEND FOR FREE CIRCULAR—

MAX ROUSE AND SONS
361 S. Robertson
OL. 5-9300

TAUBER-ARONS COMPANY
8913 W. Olympic
OL. 5-9170

BEVERLY HILLS, CALIF.—Auctioneers

PRESSES
BRAKES SHEARS

Will Lease or Furnish Long Terms

JOSEPH HYMAN & SONS
2600 E. Tioga St., Philadelphia 34, Pa.

AMERICA'S LARGEST CRANE REBUILDING SERVICE

- ANY CRANE CAN BE MODERNIZED TO THE MOST EXACTING SPECIFICATIONS
- MECHANICAL & ELECTRICAL RECONDITIONING
- BRIDGE SPANS & HEADROOM ALTERED
- OVER 100 USED CRANES AVAILABLE
- MANUFACTURERS OF SilenTorque CRANES

POLLOCK INDUSTRIES, INC.
SOUTH KEIM STREET, POTTSTOWN, PA. FAculty 3-5500

CRANES
BOUGHT & SOLD

ENGINEERED TO YOUR REQUIREMENTS

Ornitz Equipment Corp.
Industrial Engineering Service
595 Bergen St. Brooklyn 38, N. Y.
NEvins 8-3566

FOR SALE OR RENT

1500 HP Alco Diesel Electric Switcher Locomotives. New 1949. Excellent Condition. 7 Available.
44 Ton Gen. Elec. Diesel Elec. Loco. Cummins 190 HP Engine. 4 Traction Motors. Rebuilt.
25 Ton Gen. Elec. Diesel Elec. Loco. New 1942. Cummins Engine.
40 Ton Ind. Brownhoist Diesel Loco. Crane. New 1946. Caterpillar Eng.
25 Ton Ind. Brownhoist #5 Diesel Loco. Crane. New 1941. Cat. Eng. Recond.
60 Ton Link-Belt K-595 Lifting Crane. 120' Boom. Cat D-17000 Diesel.

WHISLER EQUIPMENT CO.
1910 Railway Exchange Bldg., St. Louis 1, Mo.
CHestnut 1-4474

eastern Rebuilt Machine Tools

THE SIGN OF QUALITY—THE MARK OF DEPENDABILITY

BROACHING MACHINES
Model HD 10-90 American Broach & Machine Co., Horiz., m.d.
10 ton, 84" stroke LaPointe Single Ram Vertical Surface Broach, m.d., late
Type SBD-42-6 American Vertical Hy. Dup. Broach
Type SBD-48-15 American Vertical Dup. Ram Surface Hydraulic Broach

RADIAL DRILLS
3'-9" col. Cincinnati-Bickford, m.d., super service
3'-10" col. American Triple Purpose, m.d.
4'-13" col. American Hole Wizard
6'-17" col. American Triple Purpose, m.d.
6'-17" col. American Hole Wizard, m.d.
6'-19" col. Carlton, m.d., 1943
7'-16" col. American Triple Purpose, m.d.
Baush Radial Drilling & Tapping Machine, m.d.

BALL BEARING DRILLS
No. 1/2 Avey MA8, m.d.
No. 2 Avey, m.d.
No. 2LMS Leland & Gifford, m.d., H.S.
No. 2LMS Leland & Gifford, single spindle, H.S., m.d.
No. 4BM Fosdick, single spindle H.S., m.d.
No. 4MS Leland & Gifford H.S., 4 speed A.C., m.d. to spindle
1 spindle No. 2MA6 Avey H.S. Type B, m.d., 7½" overhang, 1943
2 spindle Allen, belted m.d., 8" overhang
2 spindle No. 2 Avey H.S., belted m.d.
2 spindle No. 2BMA, No. 1 Avey Production Type, m.d.
2 spindle No. 2MS Allen, H.S., m.d.
2 spindle No. 2 Leland & Gifford H.S., 8" overhang, m.d.
2 spindle No. 2 Footburt Sipp Sensitive H.S., m.d.
2 spindle Leland & Gifford H.S. Hydraulic Type, m.d.
2 spindle No. 2LMS Leland & Gifford, hydraulic step by step H.S., m.d.
3 spindle No. 2B-8" Edlund, m.d., H.S.
3 spindle No. 2MA6 Avey, H.S., m.d.
3 spindle Leland-Gifford #2LMS—H.S., m.d., late
3 spindle Leland-Gifford H.S., m.d.
4 spindle Leland-Gifford, m.d., on each spindle
4 spindle No. 15 Buffalo Bench Type
4 spindle Allen H.S., belt drive
4 spindle No. 1/2 MA8 Avey, m.d., H.D.
4 spindle Demco H.S., individual, m.d.
4 spindle No. 2MS Edlund, m.d.
4 spindle No. 2BMA6 Avey H.S., m.d.
6 spindle Allen H.S., belt drive
6 spindle Allen H.S., 7" overhang
6 spindle Leland-Gifford m.d. on each spindle, No. 2 Taper
6 spindle No. 1 Avey High Speed, m.d.
6 spindle No. 1/2 Avey MA8, m.d., H.S.

We carry an average stock of 2,000 machines in our 11 acre plant at Cincinnati. Visitors welcome at all times

THE EASTERN MACHINERY COMPANY
1002 Tennessee Avenue, Cincinnati 29, Ohio
MElrose 1-1241 CABLE ADDRESS—EMCO

THE CLEARING HOUSE

COMPRESSORS

No better values at any price

100 CFM 100 psi 6 x 7 Ing. or Worth.
138 CFM 500 psi 7 x 7 Ing.—CPT—Worth.
142 CFM 125 psi Ingersoll Rand Type 40-Jaeger.
183 CFM 150 psi 7 x 7 Joy WG9.
191 CFM 300 psi 9-4¼ x 9 ES-2.
194 CFM 125 psi 7-7-6 x 5 Worth. M40.
234 CFM 100 psi 9 x 9 Ing.—Worth. Chic. Penn.
290 CFM 75 psi 10 x 9 Ing. ES-1.
364 CFM 100 psi 10 x 9 Joy WG9.
465 CFM 100 psi 12 x 11 IR—Amer.
502 CFM 125 psi 12 x 13 Ing. Rand.
585 CFM 100 psi 15-9¼ x 12 Ing.
660 CFM 125 psi 11½ x 7 x 7 Joy WN 102.
670 CFM 100 psi 15-9¼ x 12 Ing. XRB.
986 CFM 100 psi 14 x 13 IR—CPT.
877 CFM 125 psi 17/10½ x 14—IR—XRB.
1055 CFM 110 psi 18-11 x 12 Ch. Pa. OCE.
175 hp G.E. Syn 3-60-208 volts, starter—MG set—Aftercode—Receiver.
1670 CFM 100 psi C300-300H Fuller Rotary.
300 hp West. Syn. 3-60-440, 80% PF.
Portable Gas-diesel 60"-600".

AMERICAN AIR COMPRESSOR CORP.
DELL AND IRON STREETS
NORTH BERGEN, N. J.
Telephone UNion 5-4848

Available for immediate sale, 40,000 square feet cast iron floor plating, 2' x 3' x 1".

ALBANY CAR WHEEL CO., INC.
P.O. Box 625 • Albany, N. Y.

Rebuilt—Guaranteed Electrical Equipment

MOTOR GENERATOR SETS

Qu.	KW	Make	D.C. Volts	A.C. Volts
2	3500	Al. Ch. (3-unit)	350	13800/4160
2	3000	Al. Ch. (3-unit)	600	13800/4160
1	2400	G.E.	300	4600/2300
1	2290	G.E.	600	13800/4160
1	1520	S. & S. (3-unit)	600	4000/2300
1	1500	G.E.	250	4600/2300
1	1250	G.E.	132/265	4160/2400
1	1000	G.E.	600	4000/2300
1	800	Whse. (3-unit)	250	4000/2300
1	750	G.E.	250	4000/2300
1	500	Whse. (3-unit)	250	4000/2300
1	500	G.E.	250	4000/2300
1	500	Whse.	125/250	4000/2300
1	400	G.E.	250	4000/2300
1	300	Whse.	125/250	400/2300
1	300	Al. Ch. (3-unit)	250	2300
3	250	Whse.	250	2300/440
2	200	G.E.	250/275	4000/2300
1	175	G.E.	250	4000/2300
1	150	Rel.	125	2300
1	150	G.E.	250/275	440
1	125	G.E.	250	4000/2300
1	100	G.E.	250	4000/2300
1	75	G.E.	250	4000/2300
4	42	G.E.	250	440/220

DIRECT CURRENT MOTORS
Adjustable and Constant Speed
(Suitable for MILL and STANDARD DUTY)

Qu.	H.P.	Make	Volts	R.P.M.
1*	3000	G.E.	600	90/180
4**UN	3000	Whse.	600	600
3**UN	2700	G.E.	415	280
1**UN	2500	Whse.	700	108/162
1**UN	2200	Whse.	600	93/133
1**UN	2000	G.E.	250	230/350
1**UN	1750	G.E.	600	200/300
6**UN	1500	Whse.	600	600
1**UN	1400	G.E.	250	165/300
4**UN	750	Whse.	250	300/700
1*	750	Whse.	250	200/400
2**	645	S. & S.	300	850/1200
2*	600	Al. Ch.	600	300/600
1*	600	Whse.	230	110/220
2**	300	Whse.	230	300/600
2	235	Whse.	230	325/975
2	150	Whse.	230	400/1200
1	125	Whse.	230	575/850
3	125	Whse.	230	350/1125
1	125	Whse.	230	450/1050
1 UN	100	Whse.	250	350/700
1	100	Rel.	250	1150/1500

*—Ped. brg. mill type. **Ped. brg. forced ventilated. UN—Unused.

T. B. MAC CABE COMPANY
4302 Clarissa St., Philadelphia 40, Penna.
Cable Address "Maesteel" Philadelphia, Pa.
Phone Davenport 4-8300

FOR SALE

ALUMINUM SHEET AND STRIP ROLLING PLANT

Complete with Melt Furnaces, Slab Molds, Hot & Cold Sheet Mills, Shears, Slitters, etc. Monthly finished capacity—2,000,000 pounds.

CURRY & HUDSON ASSOCIATES, INC.
ONE GATEWAY CENTER, PITTSBURGH 22, PA.

IMMEDIATELY AVAILABLE
Because of Mill Consolidation

3 LEE WILSON RECTANGULAR BELL-TYPE ANNEALING FURNACES

atmosphere-controlled with 9 bases, are available. Each is approximately 7' x 7' x 14'. Excellent when used for manufacture of steel coils. They have a capacity of 50 tons per charge. These top-grade furnaces are still set up in the plant. Tremendous values specially priced for prompt sale.

NATIONAL MACHINERY EXCHANGE
136 Mott St. New York 13, N. Y.
CAnal 6-2476

HIGHER CAPACITY MODERN DESIGN LOWER PRICE

WITH THE **MUBEA** UNIVERSAL IRONWORKER

Sizes Jr., #0, #½, #1½, #2½
Immediate delivery in your area
Write for brochure and nearest dealer

EHG
RA 3-8821
E·G·HELLER'S SON INC.
7039 E. SLAUSON, L.A. 22, CALIF.

OFFERING

BRIDGE CRANES

ARNOLD HUGHES COMPANY
2765 PENOBSCOT BLDG. DETROIT, MICH.
WOodward 1-1894

'BUFFALO' BENDING ROLL

#2 Pinch-Type, As New—$13,000

Capacity: Flats 9/32" thick x 7" wide to 8" I.D., to ½" x 4" to 16" I.D. Average rolling speed: 35 fpm. Machine may be used as a precision pinch type bending roll. 5 HP motor; reversing starter for 3 phase, 60 cycle, 440 volts, step down transformer to 110 volt at push button station. Bijur lubrication system, hydraulic pump and 2 HP motor with pilot-operated check valves. Hydraulically-adjusted rolls precede and follow main pinch rolls. Top roll raised by air for quick removal of finished work. Controllable squeeze pressure for various material thicknesses. Hardened and ground tool steel mandrel is approx. 7⅞" dia. by 7" long. Larger diameters can be rolled without change in mandrel diameter.

Phone or Write Mr. Beutler—CLeveland 4567

BUFFALO FORGE COMPANY
490 Broadway, Buffalo 5, New York

Keep 'em rolling . . . not rusting

FOR SALE

10—70-ton Hopper Cars, reconditioned
2—Whitcomb 20-ton Locomotives
10—40' Flat Cars

MARSHALL RAILWAY EQUIPMENT CORPORATION
328 Connell Building, Scranton 3, Pennsylvania
Diamond 3-1117 Cable MARAILQUIP

Lou F. Kinderman

P. O. Box 182, Niles, Ohio OLympic 2-9876

FOR SALE

1—4000# Brosius Co. electric, furnace charging machine was used for charging ingots.
1—30" Murray-Way Micro Polish Unit.
1—36" Slitting Line, Yoder Co. with scrap chopper, uncoiler, recoiler, and tables.
1—66" Decoiling and Shearing Line including Backed-up Leveler, hump table, gauge table.
14—Stands of Bar and Rod Rolling Mill complete except for drive.
1—18" 2 High, Farrel Double Rolling Mill, 28" face.

FOR SALE!

SLIGHTLY USED GOV'T SURPLUS

BULLARD VERTICAL TURRET LATHE

36" Diameter Chuck - rail head travel 24", cross rail-head travel 21", Universal type—Spiral drive —late model.

BROACHING MACHINE

Mfd. La Pointe Co. V 3. 15 ton, 42" stroke vertical, late model.

CENTRIFUGAL PUMP MFD. FAIRBANKS MORSE

30" bottom suction—24" horizontal discharge. Rated capacity 25 M.G.D. at 210' head.

★

MACHINERY AND STEEL DIVISION
UNITED IRON & METAL CO., INC.
2545 Wilkens Ave.
Baltimore 23, Maryland
Wilkens 7-5600

GET CASH NOW
for your new surplus motors, controls and transformers!

AVAILABLE: NEW MOTORS
Over 5,000 new motors in stock from 1HP to 200HP. Special low prices

Write, wire or phone collect!

AJAX ELECTRIC MOTOR CORP.
P.O. Box 262 Whitestone, N.Y.

OVER 1,000 NEW AND USED MACHINE TOOLS IN STOCK

WRITE FOR LATEST STOCK LIST

MILES MACHINERY COMPANY

2041 EAST GENESEE • SAGINAW, MICH. PL. 2-3105

SALE 6,000 LB. RENT

CECO DROP

Forging Hammer. Serial #1763L5. Mfg. 1955. Inserted Guides. Less than 3 months use. Guaranteed Equal To New. Dismantled—Ready To Load—$35,000.

ERIE EQUIPT. CO.

TE 4-1894, 4700 Burlingame, Detroit 4

FOR SALE

SMALL DIE CASTING PLANT

5 Lester Phoenix Machines
Can be seen in Operation

BOX H-98

c/o The Iron Age, Chestnut at 56th, Phila. 39

LIFTING MAGNETS

A complete magnet service. Magnets, new & rebuilt, generators, controllers, reels, etc.

Magnet specialists since 1919

Goodman Electric Machinery Co.

1060 Broad St. Newark 2, N. J.

WICKES-SMALLEY GENERAL THREAD MILLS

2—MODEL NO. 30 MACHINES, SERIAL NOS. 7330-3 AND 7330-4, NEW, NEVER USED, MFD. 1952.

1—MODEL NO. 44 MACHINE, SERIAL NO. 7331-5, NEW, NEVER USED, MFD. 1952.

A. O. HALL

1362 SHAWVIEW AVENUE E. CLEVELAND 12, OHIO

PO 1-6917 — LI 1-0191

FOR SALE

SURPLUS STEEL

40 TONS—5" x 3" x ¼" x 14'2" ANGLES
40 TONS—5" x 3" x ⅜" x 14'2" ANGLES
20 TONS—2½" x 4½" x 18'6" FLATS
20 TONS—6" x 4" x ¾" x 18'6" ANGLES
25 TONS—12" x 40.8# x 24'6" BEAMS

WALLACK BROS.

7400 South Damen Ave. Grovehill 6-7474
CHICAGO 36, ILL.

FOR SALE

4 only 5 ton capacity "Tram-Chief" double girder underhung floor or cab control cranes equipped with Shepard Niles hoists, span 48'-8", overall 49'-9". Will operate on wide flange or I beam track. Can alter trolleys to fit Cleveland, Whiting or American Monorail. 220/440 3 phase 5 step variable speed all motions. Equipped with electric interlock for locking bridges together for 100 ft. coverage, will alter spans to suit. New Government Surplus.

Crane Hoist Engineering Corp.

8515 Salt Lake Avenue Bell, California

HENRY & WRIGHT 150 TON CAP. DIEING PRESS

3" Stroke 1947; Dble. Roll Feed; Scrap Cutter; 30 HP 220/3/60 Varidrive Motor

SEABOARD STEEL CO., INC.

UN 5-0929 New Haven, Ct.

MOTORS • GENERATORS
TRANSFORMERS
NEW • REBUILT

ELECTRIC EQUIPMENT CO.

WORLD'S LARGEST INVENTORY
CALL COLLECT GL 3-6783
P.O. BOX 57 • ROCHESTER 1, N.Y.

FOR SALE OR LEASE

70 All Steel Twin Hopper Cars
60-ton Capacity
Fully Repaired
Immediate Shipment

Phone — Wire — Write

HYMAN-MICHAELS COMPANY

108 N. State Street Chicago 2, Ill.

Phone: DEarborn 2-5422

EQUIPMENT AND MATERIALS WANTED

LARGEST BUYERS
in any quantities
OF SURPLUS—NEW & USED
Structurals—All Types of Steel
Pipe—Tubing—Tanks—Boilers
CALUMET IRON & SUPPLY CO.
175 E. Chestnut St. • MIC 4-4100

WANTED TO PURCHASE—any quantity

CARBON—ALLOY—STAINLESS

Bars—Billets—Sheet—Plate

THE GILBERT MERRILL STEEL CORP.

91 New York Ave., Westbury, L. I., N. Y.
EDgewood 3-7300

WANTED
BRIDGE CRANES

ARNOLD HUGHES COMPANY

2765 PENOBSCOT BLDG. DETROIT, MICH.
WOodward 1-1894

WANTED SURPLUS STEEL

WALLACK BROTHERS

7400 S. Damen Ave. Chicago 36, Illinois
GROVEHILL 6-7474

SURPLUS STEEL

NEW *WANTED* USED

Structurals, Plate, Pipe and Tubing

Consumers Steel & Supply Co.

P. O. Box 270, RACINE, WISCONSIN

WEISS STEEL CO. INC.
600 WEST JACKSON BLVD.
CHICAGO 6, ILLINOIS
Buyers of Surplus Steel Inventories
39 Years of Steel Service

EMPLOYMENT EXCHANGE

Help Wanted

STEEL SALESMAN

Excellent opportunity for salesman with warehouse or mill experience in flat roll products, high carbon and stainless steel. Headquarters in East. Excellent promotion possibilities.

BOX H-97

c/o The IRON AGE, Chestnut at 56th, Phila. 39

FORGE SHOP SUPERINTENDENT

Flat Die Forge Shop. Must have Hammersmith experience. Plant located in Ohio. Reply

BOX H-95

c/o The IRON AGE, Chestnut at 56th, Phila. 39

CHIEF DRAFTSMAN—ASSISTANT CHIEF ENGINEER

Wanted by structural steel shop. Minimum 10 years experience. Location, Sacramento, California. Excellent opportunity for a good dependable man. $700 to $800 per month depending on qualifications. Submit resume of education and experience.

BOX H-96

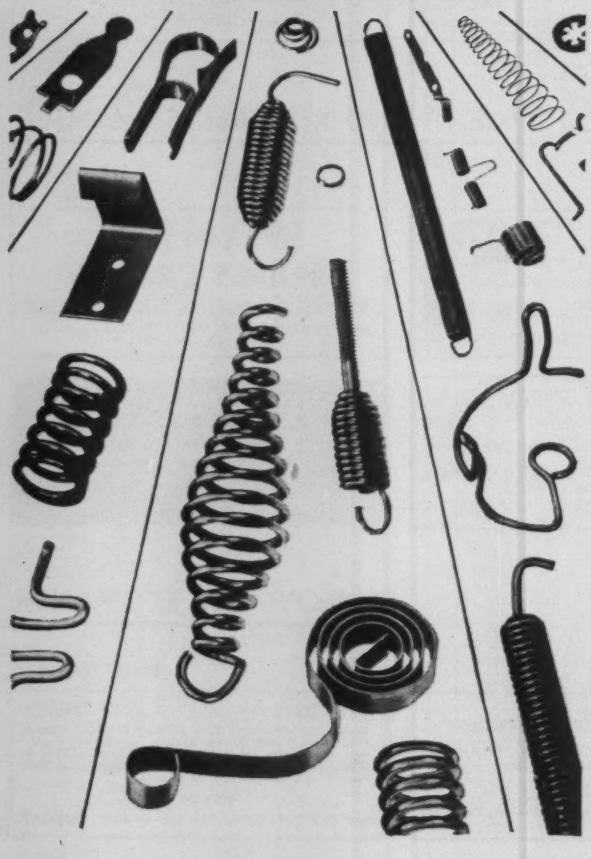
c/o The IRON AGE, Chestnut at 56th, Phila. 39

...for fast Quotes on
SPRINGS *and*
SMALL STAMPINGS
call us...

Rely on U. S. Steel Wire Spring for springs and small stampings of high carbon steel. At our plant, rigid quality control and close inspections are standard operating procedures. This insures you of getting perfect springs which help you keep rejects to a minimum, lowering your production costs. Let us quote on your requirements.

No order too large or too small!

The U. S. STEEL WIRE SPRING Co.
7800 FINNEY AVE. • MICHIGAN 1-6315
CLEVELAND 5, OHIO



ADVERTISERS IN THIS ISSUE

An asterisk indicates that a booklet, or other information, is offered in the advertisement.

This index is published as a convenience. No liability is assumed for errors or omissions.

A

Ajax Electric Motor Corp. 156
Alan Wood Steel Co. 136
Albany Car Wheel Co., Inc. 157
*Allegheny Ludlum Steel Corp. Carmet Div. 6
*Allison-Campbell Div. American Chain & Cable Co., Inc. 22
American Air Compressor Corp. 156
*American Chain & Cable Co., Inc., Allison-Campbell Div. 22
*American Chain & Cable Co. Inc., Wright Hoist Div. 51
*American Optical Co. 53
*American Smelting & Refining Co. Federated Metals Div. 39
American Society for Metals 117
Anaconda Aluminum Co. 82
*Armco Steel Corp. 4
*Atlas Car & Mfg. Co. 122

B

Belyea Co., Inc. 154
Bertsch & Co. 134
Bethlehem Steel Co. 1
*Bliss, E. W., Co. 135
*Bridgeport Brass Co. 58
Broderick & Bascom Rope Co. 89
Buffalo Forge Co. 36, 156

C

Calumet Iron & Supply Co. 157
Canton Drop Forging & Mfg. Co. 151
*Carmet Div. Allegheny Ludlum Steel Corp. 6
Carpenter Steel Co. 85
*Chambersburg Engineering Co. 50
Cincinnati Shaper Co. 79
*Commercial Shearing & Stamping Co. 18
Consumers Steel & Supply Co. 157
*Copperweld Steel Co. Aristoloy Steel Div. ..... Inside Front Cover
*Cosa Corp. 126
Crane Hoist Engineering Corp. 157
Crucible Steel Co. of America 44-45, 80
Curry & Hudson Associates, Inc. .. 156

D

*Diamond Manufacturing Co. 141
*Dravo Corp. 86-87
*Drop Forging Association 8

E

Eastern Machinery Co. 155
Eastman Kodak Co. X-Ray Div. 113
Electric Equipment Co. 157
Erie Bolt & Nut Co. 133
Erie Equipment Co. 157
Erie Forge & Steel Corp. 93
*Erie Foundry Co. 153

F

Fairfield Manufacturing Co. 112
*Federated Metals Div. American Smelting & Refining Co. 39
*Fischer Special Mfg. Co. 23
Frasse, Peter A., & Co., Inc. 34

G

General Electric Co., Large Lamp Dept. 46
Gilbert Merrill Steel Corp. 157
Goodman Electric Machinery Co. 157
Goodyear Tire & Rubber Co. Industrial Products Div. 10
Goss & DeLeeuw Machine Co. 151

H

A. O. Hall 157
Hanna Furnace Corp. 119
*Hayes, C. I., Inc. 19
Heller's, E. G., Son, Inc. 156
Hughes, Arnold, Co. 156, 157
Hyatt Bearings Div., General Motors Corp. 76
Hyman, Joseph, & Sons 155
Hyman-Michaels Co. 156

I

Inland Steel Co. 129
Iron & Steel Products, Inc. 154

J

*Jergens Tool Specialty Co. 151
Jessop Steel Co. 37
Jones & Laughlin Steel Warehouse Div. 17

K

Kaiser Engineers 111
*Kemp, C. M., Mfg. Co. 48
*Keystone Steel & Wire Co. 125
Kinderman, Lou F. 156

L

Lavino, E. J., & Co. 42-43
Lewyt Corp. 157
*Lodge & Shipley Co. 38

M

MacCabe, T. B., Co. 156
*Magnaflux Corp. 132
Mandel-Camras Machinery Co., Inc. 151
Marshall Railway Equip. Corp. 154
Miles Machinery Co. 157
Milford Rivet & Machine Co. 84
Morgan Construction Co. 35
*Morse Chain Co. 30-31

N

National Acme Co. 90-91
National Machinery Co. 124
National Machinery Exchange 156
National Steel Corp. 119
Nicholson File Co. 12
Norton Co., Abrasive Grain Div. 74

O

Ornitz Equipment Corp. 155

P

Pacific Industrial Manufacturing Co. 54
Pollock Industries, Inc. 155

R

*R-S Furnace Co., Inc. 21
Rail & Industrial Equip. Co., Inc. 154
*Ransburg Electro-Coating Corp. 24
Reliance Electric & Engineering Co. 130-131
*Republic Steel Corp. 32-33
*Roebling's, John A., Sons Div., Colorado Fuel & Iron Corp. 49
*Rolled Alloys, Inc. 92
*Rolock, Inc. 123
Rouse, Max, & Sons 155
Ryerson, Joseph T., & Son, Inc. 14

S

Saint Joseph Lead Co. 55
Sandvik Steel, Inc. 94
Seaboard Steel Co., Inc. 157
Sherwin-Williams Co. 56
*Signode Steel Strapping Co. ..... Back Cover
Silent Hoist & Crane Co. 127
Socony Mobil Oil Co. 40-41
*Superior Tube Co. 52
*Synthane Corp. 114

T

Timken Roller Bearing Co. 66
Townsend Co. 88
*Trabon Engineering Corp. ..... Inside Back Cover
*Trent Tube Co. Subsidiary Crucible Steel Co. of America 80

U

*Uddeholm Co. of America, Inc. 139
*United Aircraft Corp., Norden Div. 16
United Engineering & Foundry Co. 47
United Iron & Metal Co. Machinery & Steel Div. 156
*United States Steel Corp. 25-29
U. S. Steel Wire Spring Co. 158
Universal-Cyclops Steel Corp. 72
Universal Machinery & Equipment Co. 155

W

Wallack Bros. 157
*Wean Equipment Corp. 68
Weiss Steel Co., Inc. 157
Wender Presses, Inc. 155
*Wheelabrator Corp. 120-121
Wheland Co. 20
Whisler Equipment Co. 155
*Wright Hoist Div., American Chain & Cable Corp. 51

CLASSIFIED SECTION

Clearing House 154-157
Employment Exchange 157
Equipment & Materials Wanted. 157

TRABON®

CENTRALIZED LUBRICATING SYSTEMS

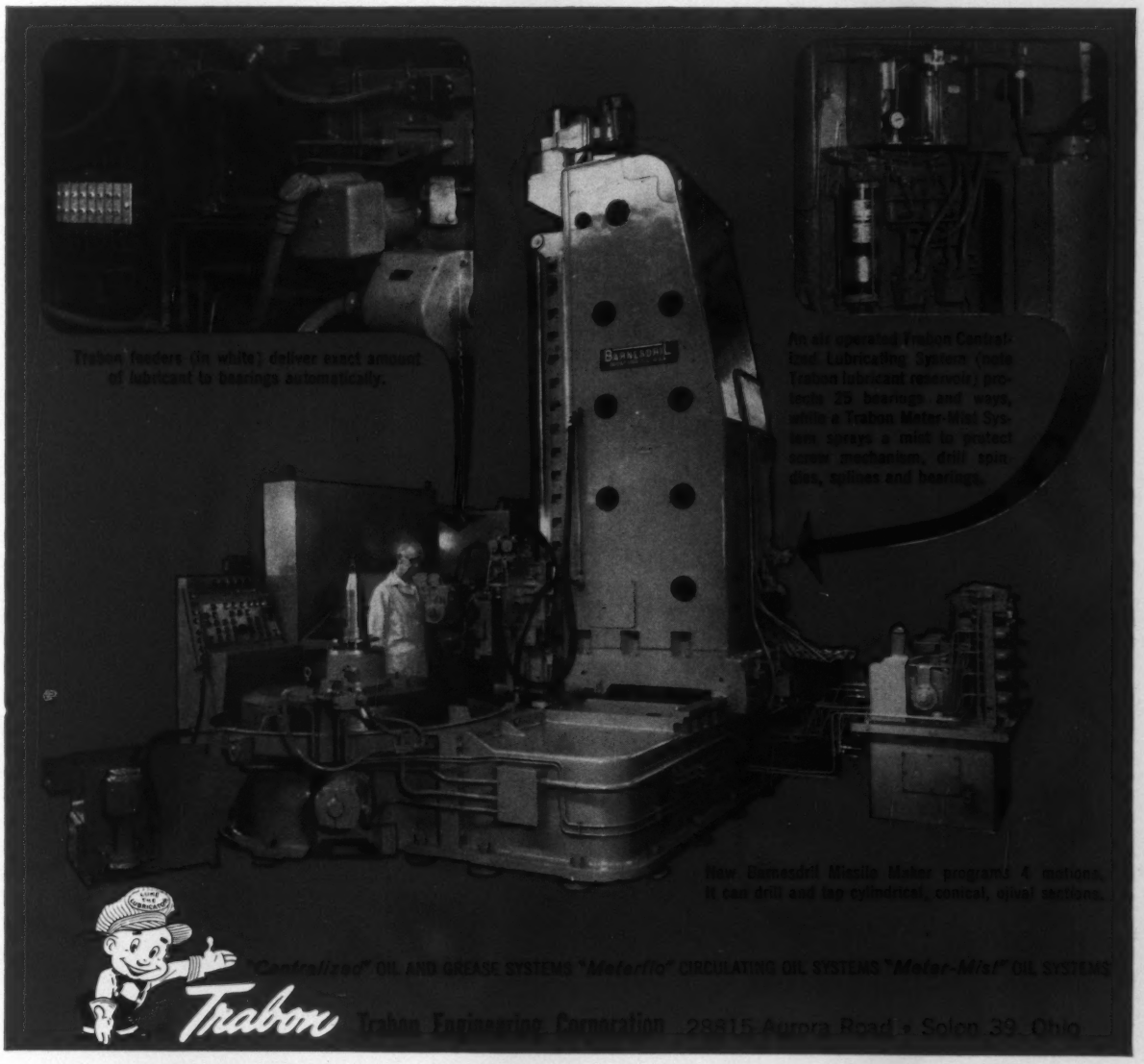
Today's machines, operating 24 hours a day, with tape and electronics doing the masterminding, demand positive automatic lubrication. First with central warning and first with positive, progressive valve operation, Trabon Centralized Oil and Grease Systems give the machine tool user and builder the most modern, dependable automatic lubrication available today.

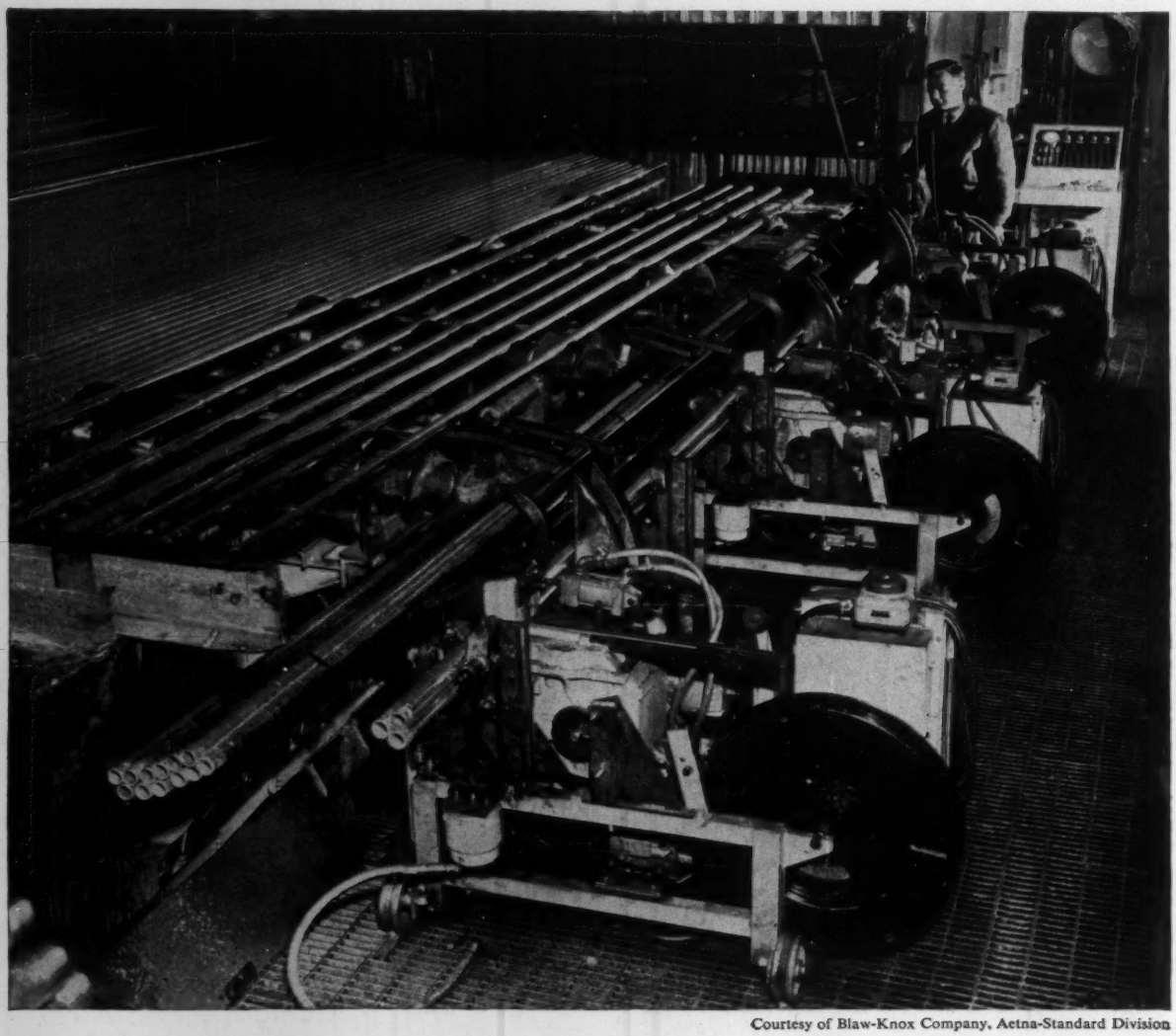
Single line type M and MX systems are easy to install, will handle all pumpable lubricants, and are available with a variety of powerful, compact, adjustable pumping arrangements. (Air-operated, mechanically-actuated, hydraulically powered, motor driven or manual).

Because of progressive valve operation, blockage anywhere in the system gives a central warning signal at the pump or control panel. ON-THE-LINE Reset Indicators quickly pinpoint trouble.

"KEEP IT RUNNING" — Top consideration of any manufacturer is assured by Trabon's better design. And Trabon Engineering and Stocking Distributors, who are as close as your telephone, will welcome the opportunity to help you. Write for technical details today.

Trabon lubrication keeps Barnesdril on the line . . .


Trabon feeders (in white) deliver exact amount of lubricant to bearings automatically.
An air operated Trabon Centralized Lubricating System (note Trabon lubricant reservoir) protects 25 bearings and ways, while a Trabon Meter-Mist System sprays a mist to protect screw mechanism, drill spindles, splines and bearings.
New Barnesdril Missle Maker programs 4 motions. It can drill and tap cylindrical, conical, oival sections.
"Centralized" OIL AND GREASE SYSTEMS "Meter/lo" CIRCULATING OIL SYSTEMS "Meter-Mist" OIL SYSTEMS
Trabon
Trabon Engineering Corporation 28815 Aurora Road • Solon 39, Ohio



Courtesy of Blaw-Knox Company, Aetna-Standard Division

New Signode machines bundle pipe in seconds

Three synchronized Signode Model MS2BR power strapping machines are at work here. They automatically apply three straps per bundle. With these machines, it is now possible to keep ahead of the production of high speed pipe mills. Uniformly tight bundles are produced.

Similar Signode power strapping machines for pipe bundling have been proved dependable in more than six years of pipe mill service. They are ideal for strapping electrical metallic tubing and rigid conduit, as well as pipe. Write for more information about these machines or this installation. Signode counsel is available to help you work out a strapping installation that meets your requirements, no matter what your product. No obligation. Just write:

First in steel strapping

SIGNODE STEEL STRAPPING CO.

2623 N. Western Avenue, Chicago 47, Illinois

Offices Coast to Coast. Foreign Subsidiaries and Distributors World-Wide
In Canada: Canadian Steel Strapping Co., Ltd., Montreal • Toronto